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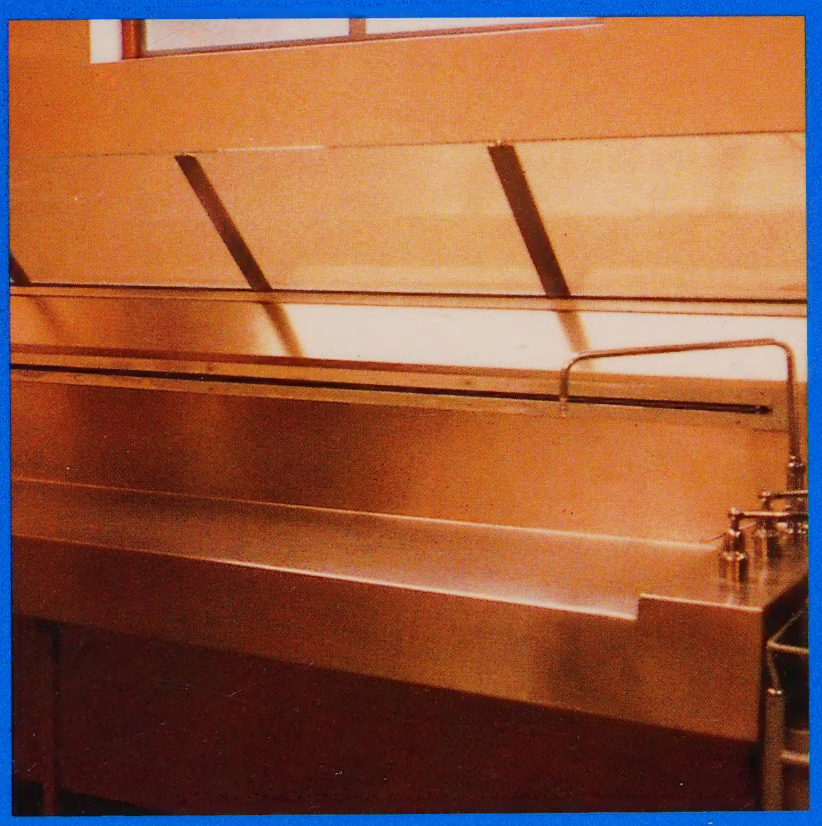
Health Building Note 20

Mortuary and post-mortem room



NHS Estates
An Executive Agency of the Department of Health

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Health Building Note 20

Mortuary and post-mortem room

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About this publication

The Health Building Note series is intended to give advice on the briefing and design implications of Departmental policy.

These Notes are prepared in consultation with representatives of the National Health Service and appropriate professional bodies. Health Building Notes are aimed at multi-disciplinary teams engaged in:

- Designing new buildings
- Adapting or extending existing buildings

Throughout the series, particular attention is paid to the relationship between the design of a given department and its subsequent management. Since this equation will have important implications for capital and running costs, alternative solutions are sometimes proposed. The intention is to give the reader informed guidance on which to base design decisions.

Health Building Note 20

HBN 20 focuses on District General Hospital accommodation for:

- Reception and storage of bodies
- Post-mortem examinations
- Coroners work incidental to the hospital service

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1.0 Scope of Health Building Note 20

Introduction

1.1 This Health Building Note (HBN) gives guidance on the planning and design of comprehensive mortuary facilities for a health district. The guidance may also be used where the full facilities are not necessary, eg where a body store with viewing only is required. It replaces Hospital Building Note 20 – `Mortuary and Post-mortem Room' (published in 1963 and reprinted with amendments 1966), and the Schedule of Amendments contained in HN(80)21 Annex IIB; this Schedule brought the Building Note into line with the requirements of paragraph 30 of the `Code of Practice for the Prevention of Infection in Clinical Laboratories and Post-mortem Rooms' issued to health authorities under cover of HC(79)3 (in Wales, WHC(79)5), dated March 1979.

Inclusions

1.2 This Note gives guidance on the design of accommodation for NHS work and coroner's work incidental to the hospital service, and covers body storage, body viewing, examination by autopsy, and the demonstration of autopsy findings in cases of clinical interest.

Exclusions

1.3 The Note does not cover:

a. accommodation for coroner's work derived from outside hospital, including that required for major forensic autopsies, but see paragraphs 2.10-2.16;

b. accommodation for undergraduate teaching, but see paragraph 3.55.

Works Guidance Index

1.4 Whilst this Note provides guidance that is current at the time of publication, it must be borne in mind that there are wider considerations associated with high-risk infectious diseases, fire, energy conservation, etc., covered by other published guidance which must also be taken into account. Additionally, some aspects of the guidance in this Note may from time to time be amended or qualified. Project teams should first check the current edition of the Works Guidance Index. Because the Index is published by the Department in May each year, and updated in September and January, project teams should ensure that they investigate the possibility of changes not included in the latest published Index.

Cost allowances

1.5 The cost allowances associated with this Note were promulgated in an Annex to Circular HN (90)21 issued by the Department of Health with the Advance Copy of this Note in September 1990.

Capricode

1.6 Capricode is the mandatory procedural framework governing the inception, planning, processing and control of individual health building schemes. The aim is to promote a consistent and streamlined approach to capital development that achieves best use of resources through the selection and construction of relevant cost effective schemes that open on time and within budget. It identifies the main activities and provides a framework for delegation with effective management and the proper accounting for expenditure and performance. (See 'Capricode Health Building Procedures'-issued with HN(86)32-in Wales, WHN(86)62.)

Equipment

1.7 Equipment is categorised into four groups, as follows:

Group 1: items (including engineering terminal outlets) supplied and fixed within the terms of the building contract;

Group 2: items which have space and/or building construction and/or engineering service requirements and are fixed within the terms of the building contract but supplied under arrangements separate from the building contract;

Group 3: as Group 2, but supplied and fixed (or placed in position) under arrangements separate from the building contract;

Group 4: items supplied under arrangements separate from the building contract, possibly with storage implications but otherwise having no effect on space or engineering service requirements.

Group 1 items are provided for in the cost allowance associated with this Note.

The Equipment Cost Allowance Guide (ECAG) specifies a sum of money for the functional unit for Groups 2, 3 and 4.

2.0 General service considerations

Purpose and objectives

2.1 A mortuary and post-mortem room fulfils four functions, which, so far as possible, should be kept physically separate. These four functions are:

a. the receipt and temporary storage of bodies;

b. investigations into the cause of death by performing a post-mortem examination of the body;

c. the demonstration of autopsy findings in cases of clinical interest;

d. the viewing or identification of a body.

It must be possible for these four functions to be carried out simultaneously in safety and privacy within the overall accommodation, which should be designed to achieve this end. The receipt and collection of bodies must be achieved safely and discreetly.

Factors influencing planninq and trends

2.2 The 1980's saw the following significant developments:

a. Health and Safety legislation reflecting the increased awareness of the need for the protection of both staff and the public against the potential risks associated with the work place;

b. an increased joint use of NHS facilities by hospital and local authorities.

2.3 The possible joint use of accommodation to meet the requirements of local authorities must be considered in detail at the earliest planning stages: the effect of the local authority factor is reviewed in paragraphs 2.10-2.16.

2.4 The type of facilities to be provided is dependent upon many factors (see Diagram 1). The accommodation to be provided may comprise:

a. a complete mortuary and post-mortem department which will be part of a District General Hospital (DGH). In some cases, however, it may be attached to the larger of a group of smaller hospitals, which collectively provide a district service;

b. body storage provision for hospitals, which however small, will need a mortuary, ie a refrigerated body store and a bier room. Exceptionally, bodies may be stored, for a few hours only, in a designated secure room;

c. NHS and local authority mortuary and post-mortem provision, where it has been agreed that there should be a joint mortuary, ie the inclusion of facilities for dealing with the bodies of cases which are under the Coroner's jurisdiction.

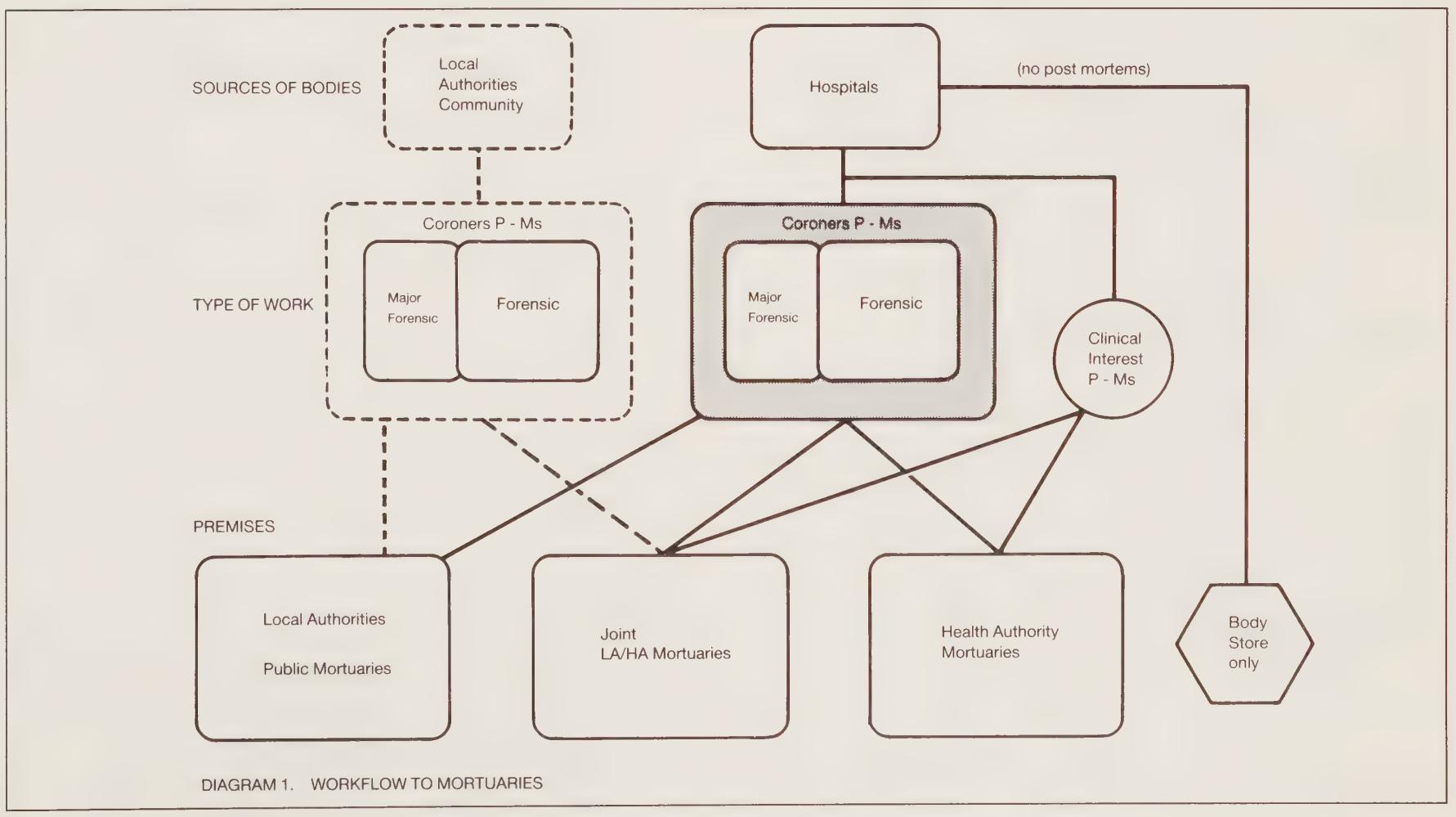


DIAGRAM 1. WORKFLOW TO MORTUARIES

Reception and storage of bodies

2.5 Bodies should not be taken in and out of the building within sight of patients and/or visitors: nor should it be possible for visitors or others to enter any part of the mortuary by mistake. Convenient and separate access should be arranged for: the medical and mortuary staff; visiting relatives; undertakers; and other authorised persons whose entry is essential; and for the bodies of people who have died in hospital. The mortuary entrance for hearses should be covered and screened from the view of patients and the public. There should be sufficient space for large vehicles to manoeuvre. An exit to a subsidiary road, and nearby car parking space, are also desirable. (Reference should be made to Health Building Note 45 – 'External works for health buildings', in preparation).

2.6 A refrigerated body store is required:

a. to maintain body tissues in a condition whereby the maximum scientific information can be obtained from a post-mortem and subsequent analytical investigations;

b. to prevent tissue decomposition while burial or cremation arrangements are being made;

c. to hold bodies and the occasional specimen for longer periods in conditions of security.

2.7 Bodies usually remain in the mortuary for one to four days. Sometimes the period is longer if further investigations have to be carried out by the pathologist, or if the next-of-kin are difficult to trace.

2.8 Bodies are kept in the body store and examined in the post-mortem room. Specimens obtained during post-mortem examination are immersed in fluid in various sized containers. These may then be held for a short time in the post-mortem room or stored temporarily in the specimen store room prior to despatch to the pathology department for examination, primarily in the histopathology department.

Post-mortem accommodation

2.9 Autopsies are often required and several may be performed in one day. No post-mortem room should have fewer than two tables, as this enables the pathologist to carry out several examinations at one attendance. However small the usual workload, there will be an accumulation of bodies during Bank Holidays and as a result of major incidents and epidemics.

Coroner's work

2.10 Coroner's autopsies may be required on:

a. deaths occurring in hospital;

b. people brought to the Accident and Emergency Department who are dead on arrival;

c. deaths occurring outside the hospital which may be referred to a public mortuary run by the local authority. Increasing numbers of such cases are being dealt with in NHS mortuaries where there is an arrangement for joint use.

2.11 Paragraph 6 of HM70(50) advises that where new hospital mortuaries are being planned, health authorities should consult with local authorities to ascertain whether joint mortuaries (on a cost sharing basis, including capital costs) could be provided for the needs of both authorities. Where a joint local authority/health authority mortuary on a cost sharing basis has been agreed, the Coroner's requirements will need to be met at the expense of the local authority in so far as they are different from the health authority requirements.

2.12 It is for individual health authorities to determine with the local authority concerned the specific requirements and scale of need for each project arising from an agreement to have joint mortuary provision. The following paragraphs review some of the factors which might be influenced by inclusion of the local authority component in an NHS mortuary.

2.13 The main advantages of such arrangements are:

a. post-mortem examinations ordered by the Coroner would be done in the hospital, including those on patients who died in the hospital. The hospital medical staff with an interest in the examination can more easily attend. The pathologist is more likely to be fully briefed on the events before death. Ready access to laboratory facilities for post-mortem investigations on specimens obtained during examination of the body and reference to ante-mortem results would enhance the educational value of the examination and its role in clinical quality assessment and medical audit;

b. staff time can be saved in a joint mortuary;

c. the bereaved can probably relate more easily to the known hospital, especially if there are autopsy findings to be explained;

d. the potential for saving of public funds as a whole from economies of scale. The savings in both capital and revenue costs, taking into account the expected amount of use by the local authority and the hospital authority respectively, and the running

costs on the basis of actual use, can be shared equitably between the health and local authorities.

2.14 Factors of particular importance when a mortuary is being planned for joint use by the local authority include:

a. suitable arrangements for increased vehicular traffic to the mortuary and for bodies arriving from outside the hospital out of normal working hours;

b. special security arrangements, eg lockable body store facility and safe storage of clothing and other belongings removed from bodies;

c. the possible need for the coroner or forensic pathologist to have exclusive use of the mortuary, or part of it, on particular occasions;

d. attendance by coroner's officers, police, persons attending to identify a body, photographic and video-recording crews and other personnel as necessary, with need for space and privacy on a permanent or intermittent basis;

e. the possibility that non-hospital coroner's cases will present an unsuspected risk of infection;

f. the likelihood of a malodorous or verminous body. Careful consideration should be given to the location and orientation of the mortuary to minimise problems which may arise from solar gains when dealing with a malodorous body;

g. the need for facilities for cleansing dirty bodies;

h. provision for major forensic work such as cases of suspected homicide. This would be decided locally after consultation with, for example, the Home Office Pathologist, the Coroner and the police. Provision could be required for: deep-freeze body cabinets; portable x-ray facilities, or easy access to a radio-diagnostic department which may need to be outside normal working hours; photographic facilities; and a direct private telephone line;

j. requirements of an observation gallery or tiered area for observation by several people;

k. need for more body store spaces and more post-mortem tables. The pace, nature and scale of work may warrant option appraisal of alternative systems of body storage and provision in the post-mortem room, (ie double-ended body stores, tray storage using the tray as alternative to the post-mortem table), and the provision of more than one post-mortem room;

m. possible need for cooling of the mortuary and post-mortem room because of heat generated by photographic and video recording equipment;

n. careful selection of site for mortuary, in view especially of (a), (e), and (f).

Possible project option of a table in a separate room

2.15 The Department of Health and Social Security and Welsh Office Memoranda 'The Control of Viral Haemorrhagic Fevers' and 'Rabies' indicates that a post-mortem examination on a person known to have died from either of these diseases exposes staff to unwarranted risk and should be avoided. In exceptional circumstances, limited sampling may be necessary either to establish or eliminate the diagnosis of such infection or to provide another diagnosis. Any sampling should be carried out only after consultation with appropriate specialists, within a flexible film isolator, and adopting stringent protective measures. A separate post-mortem room is not indicated for this purpose.

2.16 A mortuary and post-mortem room built to the standards of this Note would be adequate for dealing with bodies of known, suspected, or unsuspected infection risk (eg M tuberculosis, hepatitis B virus and human immunodeficiency virus). Where, however, a project need for several tables has been identified and/or there is a joint NHS/LA facility, or there is a significant undergraduate teaching commitment, locating one table in a separate post-mortem room may have the following benefits:

a. forensic autopsies - requiring lengthy examination, privacy, the presence of police, photographic equipment and crew - can be performed here without disruption of routine work;

b. post-mortem examinations for teaching purposes can be conducted without distraction or haste;

c. when necessary, examinations of malodorous, decomposing bodies, or bodies of patients of known or suspected infection risk can be undertaken in the separate room. The number of people in attendance will be limited, and the area exposed to potential contamination, and requiring cleansing, reduced. In addition, the examination need not wait till the end of the day's work, as would be good practice if all the tables were in one room.

Safety

2.17 This section of the Note describes, for the benefit of planners, a system of work directed at reducing risks arising from work in the mortuary complex. Detailed

guidance on good practice for post-mortem room staff is to be published by the Health Services Advisory Committee. The Note indicates the features of planning and design of a mortuary that allow work to proceed safely and efficiently at all times, provided clear and sound safety disciplines are understood and adhered to by all staff (see paragraphs 3.7-3.28).

Staff changing

2.18 The facilities required for staff changing are for:

a. **Removal of overcoats, jackets and hospital white coats worn outside the mortuary**
Pathologists and mortuary staff will need to change out of outer garments and place them, together with other items requiring safekeeping, in the lockers provided for this purpose in their respective offices (see Diagram 2);

b. **Changing into protective clothing**
Before entering the post-mortem room to conduct or observe a post-mortem examination (or related work), all staff will need to change into protective clothing. Facilities will therefore be needed for holding personal clothing and stocks of the clean protective garments prescribed by local policy. Changing rooms with lockable storage space should be associated with the transit area which gives access to the post-mortem room (see Diagram 2).

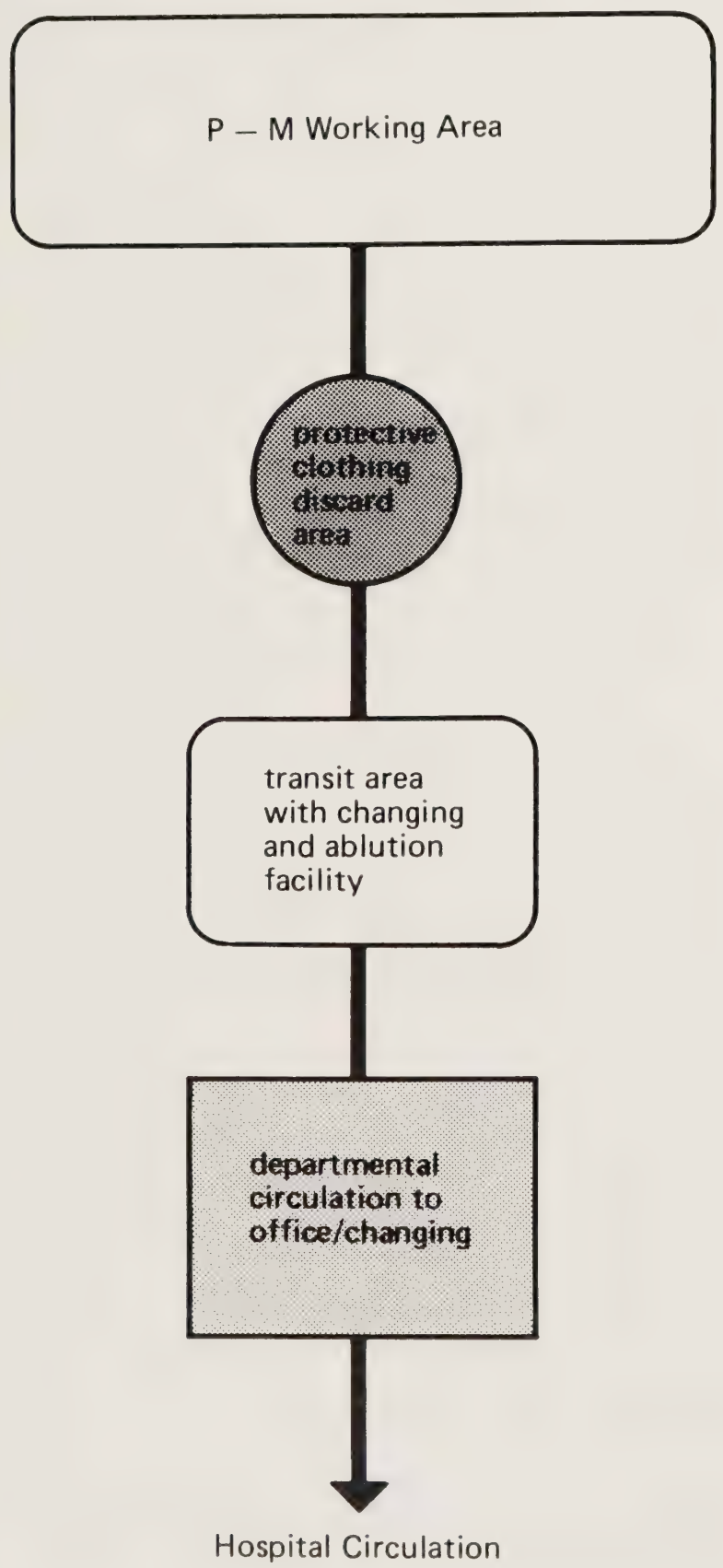

P – M Working Area
protective clothing discard area
transit area with changing and ablution facility
department circulation to office/changing
Hospital Circulation
- P-M Working Area and possible sources of contamination
- For discarding outer and disposable protective clothing, gloves etc. in receptacles, changing boots and handwash facilities. This activity can be in a transit area or in a defined zone within the P-M room.
- Ablution zone with shower, w.c and hand wash opening off the transit area which links the post-mortem room to the departmental circulation.
- change into outdoor clothing.

Diagram 2 WORK FLOW PRINCIPLES

Statistics

2.19 Relevant statistical data is presented in the following tables.

Table 1
Deaths and post-mortems in England and Wales

		1980	1982	1984	1986	1987
*	Estimated population (000s)	49,603	49,601	49,764	50,075	50,243
**	Total registered deaths (000s)	581.4	581.9	566.9	581.2	567.0
***	Deaths in NHS hospitals (000s)	332.5	338.5	330.4		
	(% of total deaths)	57%	58%	58%		
****	Total post-mortems in NHS mortuaries (000s)	132.0	131.8	129.1	130.4	

* CSO Monthly Digest of Statistics No. 516 (December 1988) HMSO
** CSO Annual Abstract of Statistics No. 123 (1987) HMSO
*** OPCS Mortality Statistics Series DH1
**** DHSS Statistics SBH6

Table 2
*Deaths reported to coroners and coroners' post-mortems (England and Wales)**

	1980	1982	1984	1985	1986
Total deaths reported to coroners (000s)	170.2	174.3	174.7	182.1	181.3
Coroners' post-mortems (000s)	141.5	142.0	140.0	145.6	142.9
(% of total reported deaths)	83.1%	81.5%	80.1%	80.0%	78.8%

* Home Office Statistical Bulletin No 12/87 (1987)

Apparent trends identified from these statistics

2.20 There has been little change in the total number of post-mortem examinations performed in health authority mortuaries (see Table 1).

2.21 Increased numbers of deaths are being referred to coroners. 80% of deaths referred to coroners have post-mortem examination (see Table 2).

2.22 Informal information from NHS mortuaries shows that post-mortems performed for the Coroner form an increasing proportion of the total, while at the same time, the number of non-coroners post-mortems has fallen.

Functional units and assessment of scale of provision

2.23 The total number of mortuaries in the country has fallen in parallel with the reduction in the number of hospitals and because of centralisation of mortuary services within the districts. Many districts now have only one mortuary. The need to hold bodies temporarily in small hospitals is usually met by provision of a body store only. When new buildings replace these non-District General Hospitals, there will still be the need for a body store. A mortuary without a post-mortem examination room is a costed option included in this Note.

2.24 The assessment of scale of accommodation required should be based on an estimate of the number of bodies to be stored, the number of post-mortem examinations to be performed annually, the average daily workload, and

the maximum number of autopsies which it would be feasible for the pathologists and mortuary staff to perform in a single working day. The functional units for the basic accommodation will therefore be "body store spaces" and "post-mortem tables".

Body storage

2.25 The number of body store spaces required should be based an an estimate of the total number of bodies to be held in a year, the length of time of holding (in days), and the body store occupancy rate. Account will need to be taken of local patterns of hospital mortuary practice and arrangements with local funeral directors in order to determine reasonable future planning assumptions.

2.26 The approach outlined here is a step-by-step method for estimating body store provision. In practice, however, the precise provision will be determined by commercially available systems for body storage which usually comprise vertical compartments of three body spaces.

2.27 A brief explanation of the method is in Figure 1, and is illustrated by a worked example in Figure 2.

2.28 Whilst the step-by-step method is presented here as a systematic approach to the sizing of body stores, the health authority will need to take into account any local needs which may have a bearing on individual projects.

Body store spaces **Figure 1**

Projected population	OPCS data
Decide on death rate assumption 1000/pop/pa	On national figures, modified by local demography and OPCS projection
Calculate expected total deaths per annum	Total deaths per annum = death rate per annum x pop (in 000s)
Decide on % of hospital deaths	Make allowance for "declared dead on arrival"
Estimate future body store occupancy and length of stay	80% body store occupancy and 4 days length of stay is currently seen as a reasonable target. Allow for weekends, Bank Holidays, maintenance, seasonal demands and contingency periods. These estimates could be greatly influenced by efficiency factor of local undertaker service
Calculate number of body spaces	Number of spaces = $\frac{\text{estimated total bodies} \times \text{length of stay}}{365 \times \text{space occupancy}}$

Worked example **Figure 2**

- Projected population
  Say 220,000 district population

- Decide on death rate assumption 1000/pop
  11.3 - National OPCS data

- Calculate total deaths per annum
  = Death rate per annum x population (in "000s")

- Decide on % of hospital deaths
  55% of total deaths
  = 0.55 x 2486
  = 1367 hospital deaths per annum

- Agree expected body store occupancy and length of stay
  80% occupancy
  4 days length of stay

- Calculate number of body spaces

$$= \frac{\text{Total bodies x length of stay}}{365 \text{ x space occupancy}}$$

$$= \frac{1367 \text{ x } 4}{365 \text{ x } 0.80}$$

= 18.726 body spaces

Deep freeze provision: Additionally, 3 deep freeze storage body spaces should be allowed for longer holding of bodies, infected cases etc (ie one compartment).

Post-mortem tables

2.29 The number of tables required for the hospital service should be determined by the health authority in consultation with the local project team and users, on the basis of statistical information available for previous years and taking account of projected planning assumptions for the individual scheme.

2.30 Significant factors which need to be considered in deciding the number of tables are:

a. the need for pathologists to be enabled to perform efficiently more than one examination at a single attendance in the mortuary;

b. an assessment of the length of time normally required to perform an autopsy and the time required for preparation of the body prior to and after an examination;

c. the number of pathologists, the estimated time they could devote to post-mortem work, and the number of mortuary staff available to assist them. Pathologists may need to work simultaneously at adjacent tables;

d. the estimated annual total number of post-mortem examinations, derived from the estimated likely number of hospital deaths in a given population, with reference to data based on previous experience of the clinical interest autopsy request rate, and the pattern of referral of hospital deaths to the Coroner which are followed by autopsy;

e. the uneven distribution of work throughout the week, so that several post-mortem examinations may be required on one day;

f. a project assumption, based on consideration of the factors above, of a realistic table utilisation per week.

2.31 In the interest of good practice, and to allow for a possible accumulation of bodies awaiting examination after Bank Holidays, week-ends and an increase in deaths due to seasonal illnesses, this Note recommends that no post-mortem room should have fewer than two tables.

2.32 Assuming utilisation of five post-mortems per table per week, over 48 working weeks in the year, one table could be used for 240 post-mortem examinations.

2.33 Similarly, utilisation of seven post-mortems per table per week, over 48 weeks = 336 per table and 10 post-mortems per table per week, over 48 weeks = 480 per table, and so on.

2.34 Where applicable, when assessing functional requirements, health authorities will need to take account of any additional or special factors arising out of a commitment to provide a teaching or local authority function. These are outside the scope of this Note. (See paragraphs 2.14 and 3.55-3.56.)

Demonstration, observation, training and teaching facilities

2.35 Clinical staff and doctors visiting from outside the hospital may need to attend post-mortem examinations, particularly examinations on those cases with which they had been clinically involved during the life of the deceased. Attendance for the demonstration of autopsy findings on these cases constitutes a natural extension of clinical practice although it is also a teaching activity.

2.36 The demonstration of autopsy findings may be required as part of undergraduate or postgraduate education. Where suitable arrangements are made, demonstration may take place at hospital clinical-pathological conferences held in locations other than the mortuary. (See also paragraphs 3.55 and 3.56.)

2.37 Attendance for observation of autopsy findings may also be required in the case of coroner's examinations for persons connected with the coroner's office, and should be considered when joint mortuary provision for NHS and local authroity use is to be made.

Demonstration facilities

2.38 In the interests of safety, direct access of observers to the post-mortem room for demonstration purposes should be discouraged. All post-mortem rooms should have a separate observation area designed to meet the requirements set out in paragraphs 4.30 and 4.31. Entry to this observation area must not be via the post-mortem room. The availability of this observation facility will obviate the need for clinical staff attending an autopsy and demonstration of findings to change into protective clothing. The size of the observation area will vary according to local arrangements for the demonstration of autopsy findings. If there are overwhelming reasons for clinical staff to be admitted directly to the post-mortem room when it is to be, or is being, used, they will be required to enter via the transit area, change into the protective clothing provided and observe the agreed local protocol. This may entail extra provision for personal clothing and valuables.

2.39 Local policy may seek to limit direct observation during post-mortem examination and may arrange for the demonstration of case findings to take place in, for example, the hospital education centre or pathology department seminar room. Where it is the policy to use audio-visual aids for demonstration/teaching purposes, appropriate facilities for recording will be required in the post-mortem room.

Staff training requirements and teaching needs

2.40 In-service training of pathologists and technicians will be possible without additional accommodation in a mortuary and post-mortem room which meet the building space and design standards of this Note.

2.41 The requirements for teaching undergraduate medical students and for postgraduate medical education are described in paragraphs 3.55 and 3.56.

Relatives and visitors

2.42 Facilities are required for viewing bodies. Wherever practicable, the viewing suite should have its own external entrance. The accommodation should consist of:

a. a waiting area in which relatives can gather together and calm themselves: (it should be suitable for interviewing if necessary by the coroner's officer);
b. a viewing suite, comprising a bier room, in which the body can be placed, (screened and shut off from the remainder of the mortuary complex), and a viewing room for the relatives. (See also paragraphs 4.5 - 4.9.)

3.0 General functional and design requirements

Introduction

3.1 This Chapter provides information applicable to the accommodation as a whole on a range of topics which should be taken into account when designing accommodation for the mortuary and post-mortem services outlined in Chapter 2. Specific functional and design requirements for this accommodation are described in Chapter 4. Other general functional and design requirements are considered in Chapter 5. Comprehensive guidance on engineering service requirements is provided in Chapter 6. Costing information is given in Chapter 7 and full details of activities, equipment, environmental conditions, finishes of walls, floors and ceilings are given in the Activity Data Sheets - see Chapter 8.

Statutory and other requirements, including Crown immunities

3.2 This Note takes account as far as possible of all statutory and other requirements in force at the time of publication, but health authorities are reminded of their responsibility for ensuring compliance with all relevant statutes, regulations, codes and standards. Advice on this is given in HC(88)60/HC(FP)(88)29 - in Wales, WHC(89)20. With the general removal of Crown immunity from the NHS from 1 April 1991 and the setting up of NHS Trusts, building and planning law are legally enforceable upon the NHS. Guidance on the removal of Crown immunity is given in HN(90)27/LASSL(90)15 - in Wales, WHC(91)4 - in respect of a wide range of legislation.

Security

3.3 Assaults on hospital staff and theft of NHS property are recognised problems. The project team should discuss security with the officer in charge of the local police crime prevention department and the hospital or district security officer or adviser at an early stage in the design of the building. Fire and security officers should be consulted concurrently because the demands of security and fire safety may sometimes conflict. The attention of planners is drawn to circular HN(84)26 (in Wales, WHN(85)1) about security, and to the NHS Security Manual issued with the Circular.

3.4 The special design features of a mortuary should aid the planner who is considering its security. Only a small number of people will normally visit the mortuary. They will gain access only after ringing a bell. The nature of the work which takes place within the accommodation may attract unwanted visitors. Unauthorised entry must be prevented for reasons of both health and security.

3.5 As well as the routine need to safeguard supplies of linen, instruments and cleaning materials against theft, there are special needs for security in a mortuary and post-mortem room:

a. staff change their clothes in the complex. Storage lockers will therefore be needed;

b. it is the usual practice to remove from bodies, for safekeeping, all valuables which have not been removed previously;

c. some bodies are admitted fully-clothed. It is usual for the police to secure items of value in these cases but if the clothes are not to be removed until the time of the post-mortem examination, a local policy to determine how these possessions of the deceased are to be held is required, and lockable storage space may be needed in the mortuary.

Smoking

3.6 There must be no smoking in the mortuary or post-mortem room and associated work areas. Health Circular HC(85)22 dated May 1985 (WHC(85)31 dated June 1985 in Wales) provides guidance about smoking on health premises. While recognising that the responsibility for determining local policies rests with the health authority, the circular recommends that smoking should be restricted as far as practicable and, where it is permitted, confined to specially designated areas which are clearly signposted. In such areas, ventilation should be sufficient to prevent discomfort to non-smokers and the spread of odours to other areas of the premises.

Safety aspects of planning and design

3.7 Planning and design play an important part in the control of infection and in the implementation of preventive measures against the other potential risks associated with mortuary and post-mortem room work. These risks include:

a. **physical risks:** accidents and injuries may be associated with the use of sharp instruments,

equipment, moving heavy loads, working in insufficient and badly designed accommodation, slipping on wet floors, inadequate storage facilities and incorrect or careless techniques of work;

b. **infection risks:** arising from exposure to known, or the unsuspected presence of, infectious agents which might be present in bodies received for storage and/or autopsy. Infection may occur as a result of inhalation, ingestion, inoculation or splashing into the eyes of infectious agents dispersed from a body in various ways;

c. **electrical risks:** arising from careless or improper use of electrical equipment, or incorrect or poorly maintained fittings and connections. This is particularly important in the wet conditions often present in the post-mortem room;

d. **chemical risks:** associated with noxious and/or flammable chemicals (eg fixatives, solvents, disinfectants) which are used regularly in the mortuary and post-mortem room;

e. **radiation risks:** radioactive materials following their use for diagnosis and/or treatment and still present in the body, or from x-ray equipment used in the post-mortem room.

Safety and control of use of formalin

3.8 In particular, potential risks arising from the use of formalin must be considered when planning a mortuary complex. Formalin, a solution of formaldehyde gas in water, is in common use as a fixative to preserve tissues for microscopic examination. The vapour which arises from solutions exposed to the air is pungent and extremely irritant to the eyes and respiratory tract even at very low concentrations. Skin exposure may lead to sensitisation. The carcinogenic property of formalin/formaldehyde has so far been demonstrated only in animals. The noxious nature of formaldehyde led to the imposition of an occupational exposure limit of 2ppm (2.5 mgm^{-3}) in the air. (See 'Occupational Exposure Limits', HSE Guidance Note EH40, which is revised annually.)

3.9 Limitation of the exposure of workers to formaldehyde vapour in the post-mortem room and mortuary will be influenced mainly by careful work practices; if a bulk specimen store forms part of the mortuary complex, continuous mechanical ventilation will be necessary in that area in order to prevent the concentration in the air from exceeding the prescribed limit.

3.10 Prospective users of the unit should be consulted to determine precisely what activities involving formalin are being planned. Employers have a duty to limit exposure of their employees and others under the terms of Sections 2, 3 and 4 etc of the Health and Safety at Work etc Act, 1974. Attention is also drawn to the Control of Substances Hazardous to Health Regulations, 1988.

Safety and control of infection

3.11 A detailed post-mortem examination almost inevitably involves the dispersal of infectious material to a greater or lesser degree. Although in the majority of cases this can be controlled, certain infections which may not be obvious until the examination is under way - and sometimes not even then - may present a serious risk to those who do the work. Effective and sensible safety measures do not impede the efficient flow of work, and although these are largely a matter of careful work practice, the design of the accommodation for post-mortem examination and body storage plays an important part. Ease of cleaning is one very important factor in this. Similarly, the overall layout of the accommodation affects the ease with which safety rules can be observed and accidents prevented.

3.12 The significant risks in the post-mortem room and body store area are: slipping and falling due to the presence of fluids on the floor; and accidental cuts, either with instruments, or sharp projections, or corners of a fitting. The danger of electrocution arising from the contact of water with electricity must also be borne in mind when specifying electric appliances and switches (see paragraphs 6.79-6.82).

3.13 The finishes of walls, floors and fittings should be durable, smooth and easy to clean. There should be no crevices which collect moisture, and joints and ledges should be avoided. Non-slip, impervious, hardwearing flooring is essential.

3.14 Hand washing facilities must be provided within all work areas and should be conveniently located.

3.15 For the purpose of infection control, the mortuary and post-mortem room complex may be seen as operationally comprising clean activity areas, transit areas, and dirty activity areas. The work-flow within the mortuary and post-mortem room complex should be planned so as to minimise and obviate, where possible, the need for movement of people and materials from potentially dirty activity areas to the clean activity areas. ("Dirty" activity areas include the post-mortem room and dirty utility room, soiled protective clothing discard area, and the body store. "Clean" activity areas include reception, relatives' waiting and viewing rooms, offices, general stock and linen store and medical observation area.) Changing and shower facilities are necessary in a transit zone interposed between the post-mortem room and clean activity areas. Unauthorised entry to the mortuary and free movement between the different areas should be prevented.

3.16 Operational practice should ensure that all work with bodies, organs and unfixed specimens is strictly limited to the dirty activity areas. Specimens should be brought out of the post-mortem room only in suitable

containers and only after these have been subjected to appropriate surface cleansing and decontamination. The holding and transfer of specimens within the mortuary and subsequent transport to the pathology department are subject to 'Safe working and the prevention of infection in the mortuary and post-mortem room', Health Services Advisory Committee.

3.17 Staff and non-mortuary personnel attending in the post-mortem room must observe local policy and change into prescribed protective clothing. To prevent soiling or contamination of anything or any area outside the post-mortem room, staff and others should discard used gloves, aprons and gowns within the post-mortem room. For this reason also, boots should be discarded in the post-mortem room and a change made into slip-on footwear before leaving the room after work, or to enter the body store while post-mortem work is being done. Staff and those attending in the post-mortem room should enter and leave the room via the transit/changing area leading to the clean activity area of the mortuary (see paragraphs 4.28 and 4.29).

3.18 Further, when movement of trolleys between the post-mortem room and body store is necessary while work is in progress, care should be taken to mop up any spillages and to cleanse this, and the surrounding floor area, before trolleys are brought into the post-mortem room. Trolley wheels should also be cleansed as necessary to minimise the spread of contamination when passing into the bodystore. The dispersal of potentially infected swarf from the use of bandsaws should be considered and appropriate containment measures adopted.

3.19 Special attention must be given to the need for adequate ventilation in the post-mortem room:

a. to minimise the spread of offensive odours;

b. to minimise the possibility of infection of staff and the public by contaminated airborne droplets;

c. to maintain a comfortable working environment. (See paragraphs 3.41-3.44 and 6.34-6.41.) Careful attention must also be given to the siting of the point of discharge (see paragraph 6.32).

3.20 Narrative descriptions of the way in which equipment is used, and the way in which work in the post-mortem room is undertaken, cannot readily convey to those who are unfamiliar with such work the safety features required. It is essential that architects and others involved with a project should consult medical and other staff with a working knowledge of the department. Assistance on control of infection questions can be obtained from the hospital Control of Infection Committee.

3.21 Essential documents on safety are listed in the Bibliography at the end of this Note.

Waste disposal

3.22 Waste arising in the post-mortem room and mortuary will fall into five categories:

a. disposable, generally single-use items such as paper shrouds, swabs, dressings, disposable protective clothing and gloves;

b. human tissues and body fluids;

c. discarded syringes, needles and other sharps;

d. discarded chemicals such as used fixative solutions;

e. clean waste arising from office activity.

3.23 Waste in categories (a)-(d) is both a potential risk to health and offensive for those who are required to deal with it prior to final disposal. For safe waste disposal, arrangements for clear segregation and appropriate containment of the different types of waste, from source to final disposal point, are essential.

3.24 Most items to be discarded come under the term "Clinical Waste", and, for operational detail and categorisation using colour coded containers, reference should be made to 'The Safe Disposal of Clinical Waste', Health Services Advisory Committee and Health and Safety Commission 1982, and to 'Safe working and the prevention of infection in the mortuary and post-mortem room', Health Services Advisory Committee.

3.25 Waste organic solvents will need to be stored to await disposal in accordance with the Department of the Environment's Waste Management Papers Numbers 14, 15, 19 and 25.

3.26 In addition to the risk of infection, some materials may present a radiation hazard when radioactive compounds have been used for treatment or diagnosis during the life of the subject under examination. Guidance on this is to be found in 'Guidance notes for the protection of persons against ionizing radiations arising from medical and dental use' (Chapter 13).

3.27 In the mortuary building, two basic provisions are necessary to enable the safe management of waste. These are:

a. a sluice or sluices for material suitable for direct discharge to the drains (subject to the consent of the appropriate water authority);

b. adequate secure storage space for material in bags, packages or drums awaiting removal for incineration or deep land-fill.

3.28 The special problems of infection and radiation risks associated with mortuary and post-mortem work should be discussed at a local level and the advice of the hospital

Control of Infection Committee and Radiation Protection Adviser sought in the early stages of planning.

Location

3.29 The location of the mortuary and associated areas on the site needs careful consideration. The following factors should be taken into account:

a. the need for adequate vehicular access from the service road;

b. the functional layout of the hospital and the need for the mortuary accommodation to be sited away from clinical, kitchen and dining areas, with no direct entry to public and staff thoroughfares;

c. the desirability for the mortuary to be located at ground level;

d. the need for convenience of access by the various users, and for the mortuary to be associated with or near the histopathology laboratory;

e. the number of external entrances required;

f. the need to ensure that the exhaust from ventilation systems servicing the mortuary can be discharged safely. The siting of extract vents should be very carefully considered (see paragraph 6.32);

g. the availability of space ie size and shape of the site and the overall development control plan;

h. the local strategy for energy conservation, eg length of service runs, position and size of energy centre;

j. costs of the development, both capital and revenue.

3.30 Convenient and separate access will be needed for staff, visiting relatives, undertakers, and for bodies arriving from the hospital. There should be easy access and parking for hearses. The immediate entrance for hearses should be screened from public view, and should be accessible via a service road.

3.31 Planning decisions and site possibilities determine whether the mortuary will be located in a separate, purpose-built accommodation on the hospital site or attached to the hospital building (see Diagrams 3 and 4). The above listed requirements are most easily met when the mortuary is located independently but near the service zone. If this is not possible, the mortuary should be planned in a discrete location not readily overlooked by clinical, kitchen and dining areas and avoiding public and staff thoroughfares.

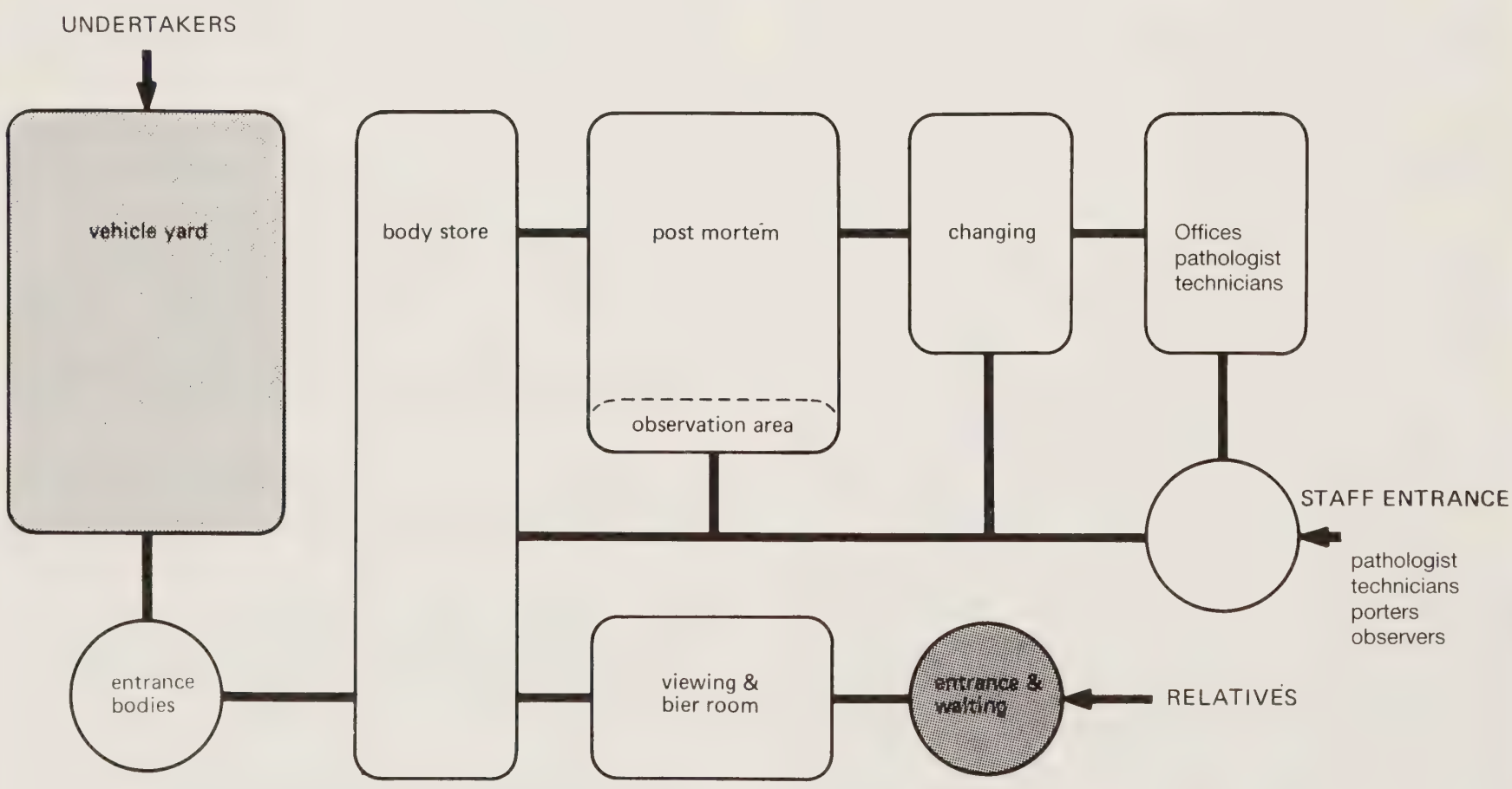


DIAGRAM 3: FLOW DIAGRAM
department free standing, not part of main building

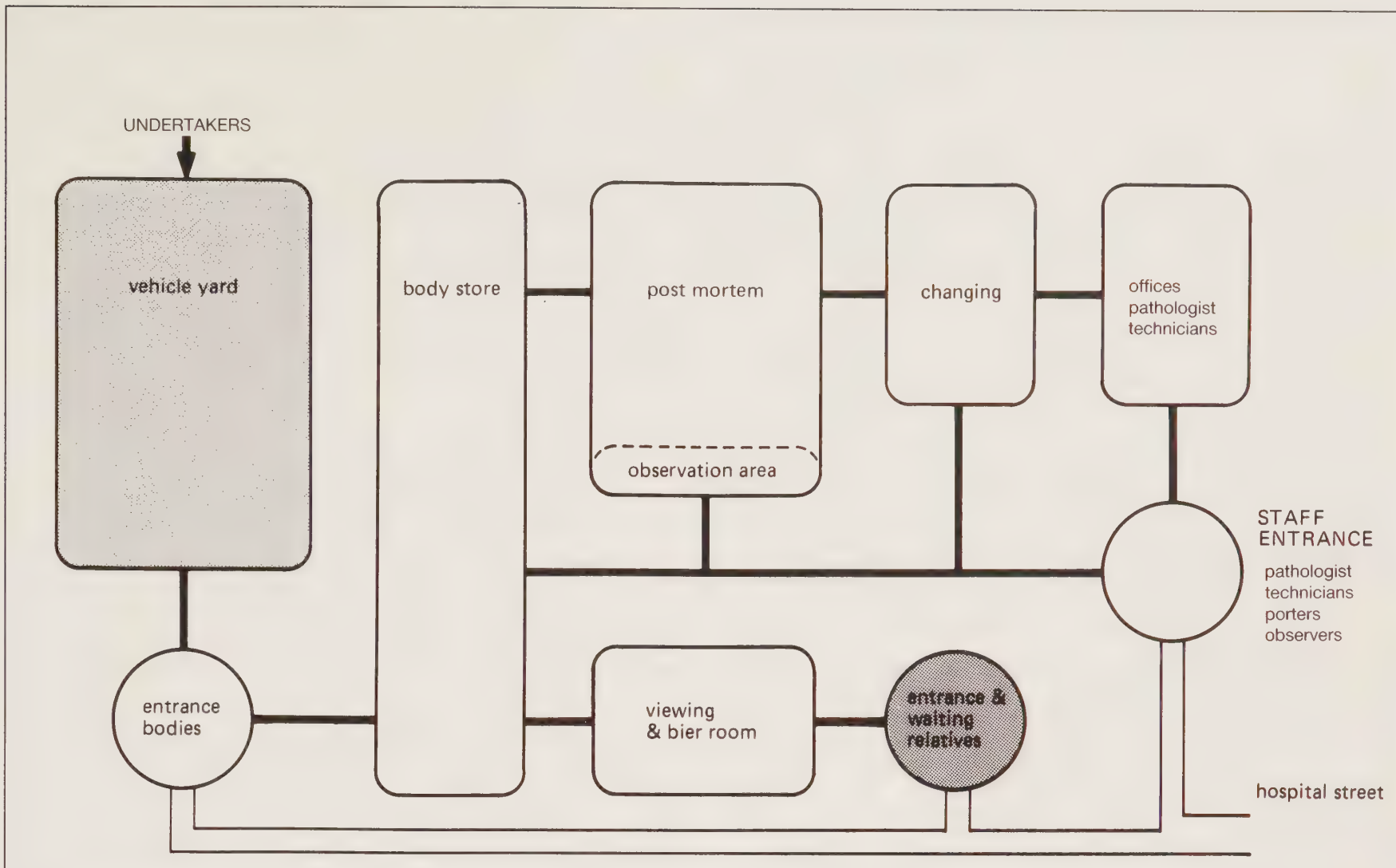


DIAGRAM 4: FLOW DIAGRAM
department attached to main building

Planning relationships

3.32 All the demands listed above will affect the planning of the accommodation, particularly the provision of separate access and the need for discrete circulation routes to obviate the risk of people straying into work areas (eg the post-mortem room). The core of the accommodation is the post-mortem room, which will be served by adjacent areas whose functions are related to the needs of the post-mortem room activities. These are the body store, other stores, viewing area and the circulation routes leading to the staff areas such as offices and staff changing. In order to minimise the spread of contamination from the post-mortem room, it should be directly connected only to the body store and sluice/instrument room and the transit/changing area, through which access is gained to circulation routes. The relationships of individual rooms to each other is shown in Diagram 5 and on Activity Data A-Sheets (see Chapter 8). Windows should be allowed for when planning the location of staff rooms and the relatives' waiting room, and non-openable high-level windows provided in the post-mortem room.

Signposting

3.33 Health Building Note 40 – 'Common Activity Spaces Volume 2 Corridors' and the Health Signs Manual, issued as Health Technical Memorandum 65, should be consulted for general guidance.

3.34 The mortuary's location should be signposted in such a way that hospital patients and visitors cannot erroneously find themselves within the accommodation by going through an inadequately marked doorway. A bell with an appropriate notice should be provided for visitors to summon the attention of mortuary staff.

Internal environmental considerations

3.35 Good interior design can contribute to staff morale and the aim should be to create a pleasant, comfortable and safe environment throughout the department within the constraints of mortuary practice.

Natural and artificial lighting

3.36 A light and pleasant interior is required with an adequate level of illumination that can be varied according to need. Because natural lighting is variable in quality and

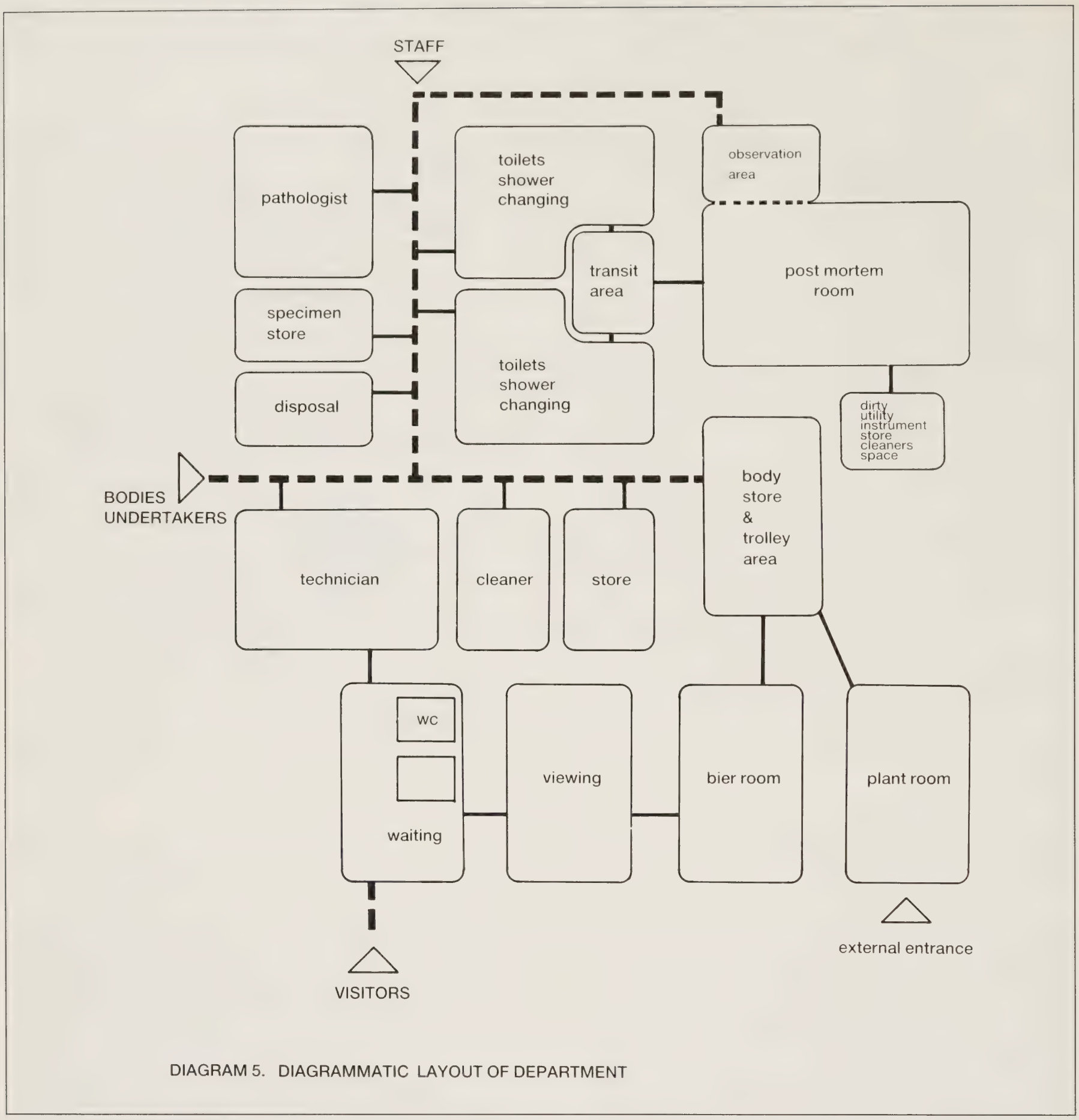


DIAGRAM 5. DIAGRAMMATIC LAYOUT OF DEPARTMENT

quantity the provision of a comprehensive artificial lighting installation is essential.

3.37 The orientation of accommodation is an important consideration in any building scheme. Sunlight within a building enhances colour and shape and helps to make a room bright and cheerful. Glare should be minimised and may be controlled by curtains or blinds. Solar gain can be mitigated by external screens or by architectural detail of the shape of windows and depth of reveals. The windows of the post-mortem room should preferably face east or north. (See Health Technical Memorandum (HTM) 55 – 'Windows', Section 2.2).

3.38 Artificial lighting should be capable of providing the required levels of illumination at all times; it also has an important contribution to make to the aesthetic appeal of the interior. The design should provide task lighting of the required intensity with low-contrast glare-free background illumination. The post-mortem room will require the use of approved colour rendering light sources. It should be possible to dim the lights in the viewing and bier rooms.

Lighting in the post-mortem room

3.39 Ample daylight should be the aim. Distribution and location of windows should take into account the need to maintain total privacy, and to prevent glare and excess solar gain. High-level windows are generally preferable to rooflights. To avoid loss of control of air movement by the ventilation system, these windows must be fixed and non-openable. Artificial lighting should provide good general illumination with higher levels for task lighting over the post-mortem tables and dissecting benches.

Acoustics

3.40 Some acoustic control will be necessary in the post-mortem room to allow for the need for quiet concentration and possibly further control any noise which may occur from the ventilation system and interfere with the use of dictating equipment used in some post-mortem departments. When selecting ceiling materials, account should be taken of the damaging effect of the damp atmosphere following frequent cleaning of the room with hot water (see HTM60 – 'Ceilings').

Ventilation

3.41 Mechanical ventilation should be provided to the post-mortem room, all rooms in direct communication with it, ie body store, dirty utility/instrument store, observation and transit/changing areas, specimen store and any other internal rooms. All other areas should be naturally ventilated. It is essential to avoid the escape of offensive odours from the working areas to other parts of the accommodation, and other parts of the building. To achieve this objective, it will be necessary to provide some form of lobby, with two sets of doors, when there is direct access from outside to the body store. No naturally ventilated space should communicate with the post-mortem room without an intervening lobby or corridor.

3.42 The air supply to the post-mortem room should promote good air distribution without generating turbulence at the working positions. Ventilation at the rear of a bench provided for examination of tissues and organs removed from bodies is essential and the exhaust volume resulting from a properly designed bench will comprise a significant proportion of the total extract from the post-mortem room. Supplementary exhaust grilles should be sited at low level. The control of air movement in the post-mortem room may be achieved partly by utilising air supplied to the body store, the observation area when provided, and by air drawn into the post-mortem room from other areas of the accommodation.

3.43 The design philosophy for air movement control and the recommended supply and extract rates are detailed in paragraphs 6.34-6.41.

3.44 When not in use, the ventilation system for the post-mortem room can be shut down, always provided that the system is allowed to run on for a limited period (a minimum of 30 minutes) after final cleaning of the room to purge residual odours and to assist in the drying of washed surfaces. The ventilation system provided for the specimen store should continue to run at all times because of the potential risks arising from formalin used for the preservation of tissue.

Finishes

3.45 The choice of finishes will be influenced by the activities in individual areas. In the post-mortem room the need is for hard wearing, easily cleanable surfaces which will not deteriorate following frequent cleaning with hot water and disinfectants. Floors must be non-slip and laid to falls, towards channels or gullies.

3.46 Channel gratings should be designed in short sections, easily lifted and capable of being disinfected by submersion in a sink or container. Skirtings should be coved for ease of cleaning.

Fittings and equipment

3.47 Fittings and equipment should be made of durable materials which will not deteriorate under continuous hard use. They should be designed for ease of cleaning and be free from sharp corners or projections to avoid the risk of cuts to the hands of users.

3.48 In the post-mortem room, plastic laminate on wood, and wooden fittings, are not suitable as fixed work surfaces. Porcelain and stainless steel are satisfactory materials for the post-mortem tables and sinks but both have some disadvantages. Porcelain, although having a high quality finish, is expensive and liable to damage; stainless steel fittings can be complex, difficult to clean and also liable to damage of different kinds. All fittings should be of ergonomically correct design for reach and height. All taps in the post-mortem room and body store should be elbow action.

Flooring

3.49 It is important to select a floor covering which contributes towards the creation of an attractive environment, but which does not present a hazard to people or the movement of wheeled equipment. It is important that whatever floor covering is chosen can be effectively cleaned, maintained and, where necessary, repaired (see HTM 61 – 'Flooring'). Floors should not present, or appear to present, a slip hazard. Surface drag, static electricity, flammability, and infection hazards are other factors which need to be considered. (See also paragraph 3.50.)

Maintenance and cleaning

3.50 Regular and intensive cleaning must be a feature of this accommodation. Materials and finishes should be selected to minimise maintenance and be compatible with their intended function. Building elements that require frequent redecoration or are difficult to service or clean should be avoided. Special design consideration should be given to elements such as entrances, corners, partitions, counters and any others which may be subjected to heavy

use. Soft floor finishes may be selected for areas used by visitors. Wall coverings should be chosen with cleaning in mind. Health Technical Memoranda 56, 58 and 61 give guidance on these aspects for partitions, internal doorsets and flooring.

Design considerations

3.51 Interior design features of the accommodation should facilitate the function of the body store and the post-mortem room and provide an efficient and safe working environment in the work activity areas.

3.52 In the visitors viewing suite a serene and reassuring environment is desirable. The choice of suitable colours and textures in all areas is important.

Design features

3.53 The following design features need to be considered:

a. windows giving maximum light but maintaining privacy and, where appropriate, giving natural ventilation without draughts (see HTM55 – 'Windows');

b. avoidance of ledges in details of floor, wall and door junctions;

c. impervious finishes to walls in the post-mortem room;

d. hinged doors capable of being held open, other than manually;

e. adequate width of doors for the safe passage of trolleys;

f. effective falls in the floors of the post-mortem room and body store;

g. ease of cleaning on all sides of all fittings wherever possible;

h. drains of sufficient diameter to prevent blockages, particularly waste pipes from sinks (see HTM 64 – 'Sanitary assemblies');

j. materials to be non-rusting, non-decaying, and non-staining;

k. ease of access for disabled visitors.

Communications

3.54 The provision of an effective communications system is necessary for the efficient management of a mortuary and post-mortem room. Communications requirements can be considered in four main categories:

a. **telephones:** these will be provided in accordance with the whole hospital telephone policy for communication with other departments, the laboratory and outside the hospital. In addition to the normal hospital telephone exchange facility, at least one direct line should be installed to facilitate the operation of the mortuary service. In dirty work areas, the use of loudspeaking instruments may need to be considered (see paragraphs 6.88 and 6.89);

b. **visitors and undertakers/staff call:** there is a need for visitors and undertakers to call the attention of staff on their arrival at the mortuary. A simple bell with appropriate notice should be provided at the appropriate entrances (see paragraphs 4.34 and 6.87);

c. **intercom:** the major communication needs within the mortuary, and between it and the laboratory, should normally be satisfied by the automatic telephone system (see paragraphs 6.88 to 6.90);

d. **dictation facilities:** it is anticipated that a purpose-designed dictation system, suitable for the conditions within the post-mortem room, will be provided (see paragraph 6.86).

Education and training

Undergraduate medical students

3.55 If the teaching of undergraduate medical students is to take place in the accommodation, and their numbers necessitate additional space and facilities, eg changing and movement into the observation area, this should be provided as part of the overall requirements for the department. Reference should be made to the Department's letter DS65/74 about teaching hospital space requirements, issued on 22 March 1974, and letter DS86/74 dated 27 March 1974.

Postgraduate medical education

3.56 Although education requiring special facilities will take place in the district's education centre, some teaching has to take place in the department. Where policy requires the attendance of doctors during postgraduate education at post-mortems and to observe case findings, use would be made either of the observation area or of the appropriate facilities for case demonstration provided elsewhere in the hospital (see paragraph 2.39). Any attendance in the post-mortem room would be subject to the protocol for entry via the transit zone and changing facilities (see paragraph 2.38).

4.0 Specific functional and design requirements

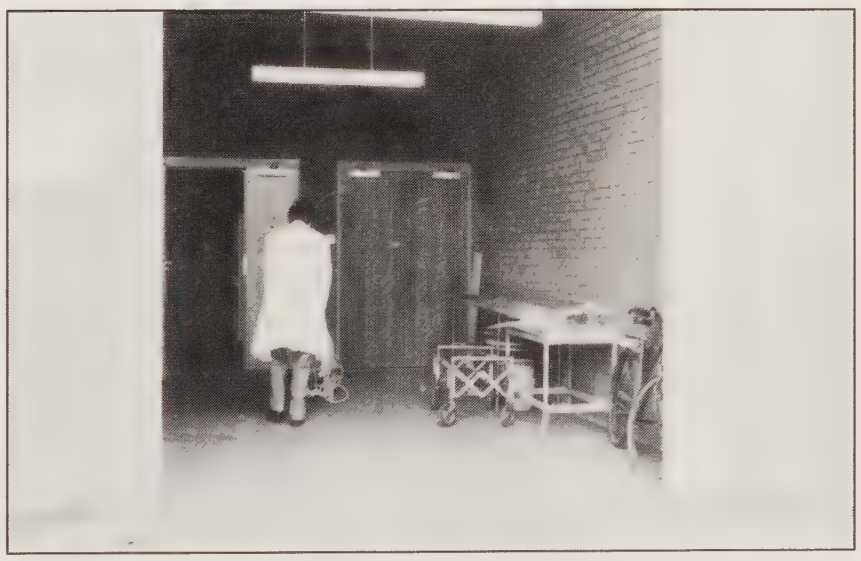
Introduction

4.1 This Chapter provides guidance on the functional requirements and design implications for each of the activity spaces within the mortuary and post-mortem room complex (see Diagram 5).

4.2 Activities, equipment, detailed environmental conditions and finishes of walls, floors and ceilings are given in the Activity Data Sheets. Reference should also be made to the relevant Health Technical Memoranda covering Component Data (see paragraph 5.22).

Entrances

4.3 The number of entrances will be determined by whether the building is free-standing or linked directly to other hospital buildings. If the former, three entrances are required: one for staff, one for the delivery of bodies from the hospital or elsewhere and for collection by undertakers, and one for visiting relatives and friends. If the latter, the number of entrances required may depend on whether staff, relatives and the arrival of bodies from the hospital share a common approach and then follow separate traffic routes to the individual entrances to the relevant parts of the mortuary. Alternatively, there may be direct access from a hospital street to the different parts of the mortuary. An entrance will be needed for bodies arriving from outside the hospital, which will also be used for collection of bodies by undertakers. (See Diagrams 3 and 4.)



Entrance

4.4 All external entrances should normally be kept locked and should be provided with a means whereby people arriving can summon attendance. All entrances should be both clearly and appropriately signposted and identified. The entrance for relatives, which may be via a lobby, should lead into the visitors' waiting room (see paragraph 4.6). As the body store is considered to be potentially dirty, entry of unauthorised personnel, for example undertakers staff and porters, should be in accordance with local operating policies governing access and the use of protective clothing. Provision will be required at the body store entrance for holding protective clothing, ie gloves, gowns and overshoes, and for discarding these after use.

Body viewing facilities

4.5 This comprises a separate entrance, a waiting room, a viewing room and a bier room.

4.6 The **waiting room** should have a relaxing atmosphere and be tastefully decorated. Comfortable chairs and a small table will be necessary. An adjacent WC is required. In this waiting room visitors will compose themselves for what is for most an ordeal. A bell push and call light should be provided to let mortuary staff know that visitors are present. The waiting room should be adjacent to the viewing room with a door between them, and should also be readily accessible for mortuary staff.

4.7 The **viewing room** should connect both with the waiting room and with the bier room. The wall adjacent to the bier room should incorporate a viewing window level with trolley height and covered by easily drawn curtains. Some visitors will want partial, or complete, direct access to the body, and a sliding viewing window and a connecting door to the bier room will be necessary. Furnishings in the viewing room need be only minimal, but a chair may be needed for those who become unsteady. Ventilation should be such that comfortable conditions are maintained in the waiting and viewing rooms and should prevent odours from entering from other areas of the mortuary.

4.8 The **bier room** should adjoin the body store and the viewing room. It should be tastefully decorated and have subdued lighting controlled by dimmer switches located in the viewing room. A body to be viewed will be prepared in the body store and laid out on a draped bier trolley which will then be wheeled into this room. Connecting doors between the two should allow easy, noiseless passage of the trolley, and while viewing is in progress, be kept securely shut. Flooring in the bier room should be washable and continuous with that of the body store or the connecting link between the two.

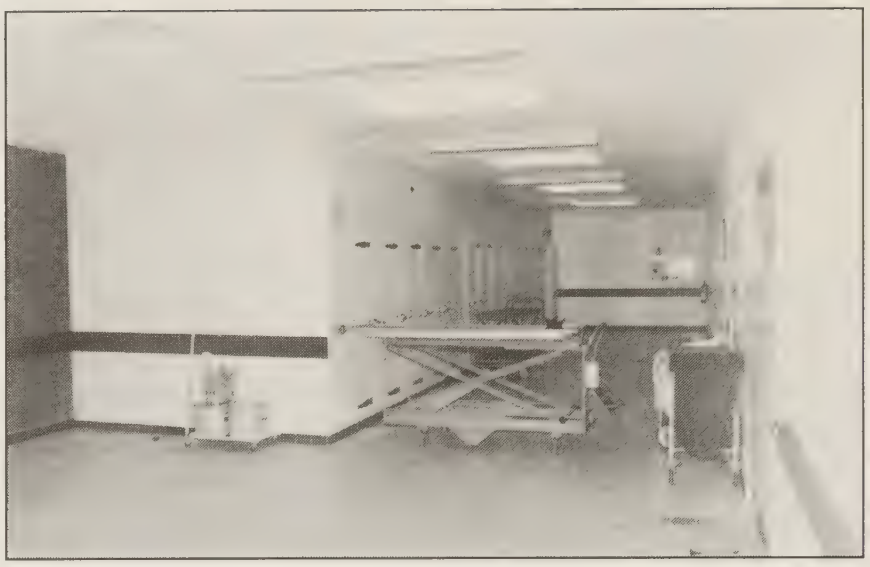
Bier room

4.9 Both the viewing room and the bier room should be capable of minor adaptation to suit the needs of all religious beliefs and for devising more appropriate arrangements for viewing bodies of infants.

Body store and trolley area

4.10 The purposes of the body store are indicated in paragraph 2.6 of this Note. The design of this accommodation should aim to achieve these objectives safely and efficiently.

4.11 The body store should be adjacent to the post-mortem room and adjoin the bier room. Space is required for parking and manoeuvring trolleys. Body weighing facilities and a mobile hoist are required. Body weighing may be carried out either on a separate weighing machine or on a trolley which incorporates a weighing mechanism. Space is also required for the reception of bodies on trolleys from the hospital, the labelling or identification of bodies and entering details in a record book, the placing of shrouds on bodies, the transfer to a refrigerated body store, the removal and transfer of bodies from the body store to the post-mortem room or to the bier room, the removal of bodies from the store, and confirmation of identity before handing over to undertakers.



Body store and trolley area

4.12 The body store consists of a number of labelled compartments, (refrigerated at 4°C), each compartment containing three or four tiered racks for bodies. Compartments will usually have doors at one end only: double-ended compartments are also available but these are more expensive and require additional space on the post-mortem room side to allow for the extraction of bodies. Depending on the size of the installation, one or two compartments will be deep-freeze. All doors must open through 180 degrees and should be lockable. All compartments should be capable of being drained. Internal rollers should be removable to facilitate cleaning inside the compartment. The bottom shelf in the rack should be not lower than the lower position of the body hoist, so that trays bearing bodies do not have to be raised by the mortuary staff during their extraction. The refrigeration plant must be fully accessible for maintenance, with access provided from outside the mortuary.

4.13 Hand washing facilities are essential in this area, along with a hot and cold wash-down point and drainage. A writing surface is required in the vicinity for the record ledger, although the recording of bodies is often carried out in the technician's office if it adjoins the body store.

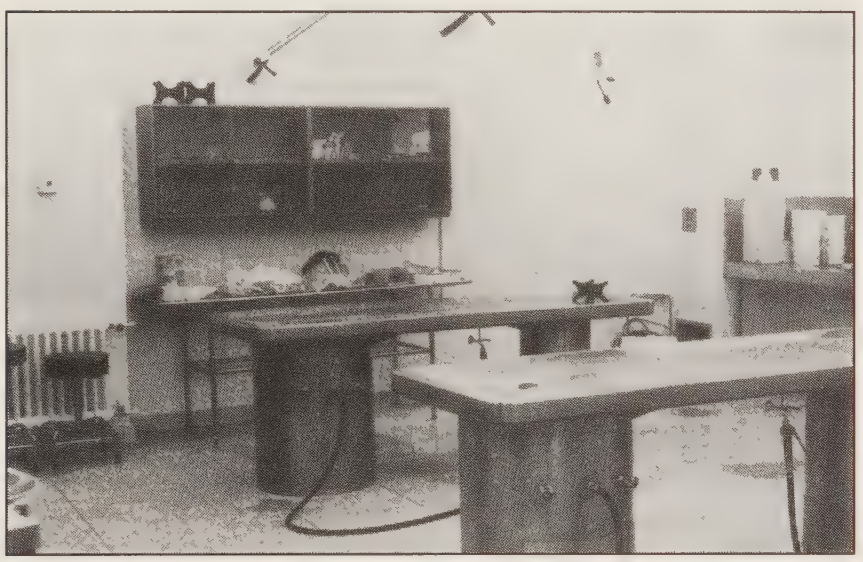
4.14 The frequent movement of body trolleys, which could be heavily-laden, and of the hoist has implications which must not be overlooked. Corners, doors and certain areas of walls must be protected against damage. Doorways through which trolleys are to pass must be wide enough to reduce the chances of collision and consequent damage to property and injury to staff.

4.15 The floor of the body store must be hard-wearing, non-slip and impervious to water and disinfectant. There must be a fall to a floor channel or gully to allow for drainage after cleansing. The walls should be capable of withstanding regular washing or hosing down and should meet the radiused junction with the floor at a waterproof joint. Ventilation should be arranged so that air flows from this area into the post-mortem room.

4.16 The trolley area is for the parking of trolleys and the hoist when not in use. It should be part of the body store area.

Post-mortem room

4.17 The post-mortem room, which is also known as the autopsy room, serves to carry out several functions. These include the opening of bodies, dissection of organs, weighing, and demonstration of autopsies to clinical staff. Bodies are brought from the body store on a hydraulic body hoist or a trolley and transferred on to a post-mortem table. The dissection of organs may take place on a dissecting bench running along a length of wall or on a board placed over the foot end of the post-mortem table or at both locations. The observation area will overlook part of the dissecting bench where this is provided.



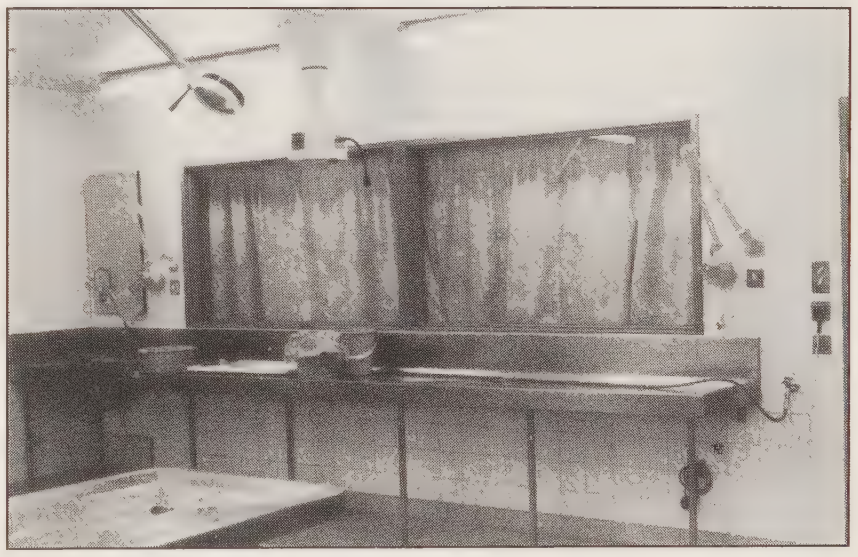
Post mortem room with dirty utility/instrument store and cleaning space

4.18 Bodies for examination would normally be expected to be conveyed into the post-mortem room on a trolley from the body store via a double-width doorway. Alternatively they may be drawn directly from a double-ended body store unit. In the latter case, space will be needed for safely manoeuvring trolleys, and for a second hoist within the room, without risk of accident or collision with tables and equipment.

4.19 The post-mortem tables should be easily cleanable, stable, and free from traps for potentially infected material.* Adjustable height tables are also available. Experience has indicated that there are advantages and disadvantages of both porcelain and stainless steel tables. However, it has been found in practice that porcelain is easier to clean than stainless steel. Each table should have a hot and cold water supply and a waste outlet of about 75mm diameter, fitted with a suitable, readily accessible, trap and drain pipe. The number of tables should be project-related, but in no case should there be fewer than two. They should be fixed to the floor, located over a drain and be supplied with water at low pressure.

4.20 During an examination, there may be a need to dictate findings, take x-rays, examine x-ray films taken earlier, and use other portable electrical equipment. Special safety precautions are required when using fixed and portable electrical equipment in the post-mortem room. (See paragraphs 6.79-6.82.)

4.21 The dissecting bench should have raised edges and slope to a sink, which should be deep enough for the washing of organs. There should be provision for running water over the bench itself. The positioning of sinks along the dissecting bench should suit the pattern of working agreed upon by the staff. A sluice is required for the opening of intestines and disposal of contents. A low pressure water pipe should be provided, preferably in the wall of the sink. A standing waste is required. A filter trap is necessary. There should be a weighing machine of simple design. It should be easily cleanable and have no traps for infected material. Preferably, it should be wall-mounted. The dissecting bench should have a specific dissecting position for each post-mortem table. Each position should have a linear exhaust ventilation grille in an upstand at the rear. The recommended size of, and performance data for, the extract grille are described in Chapter 6.

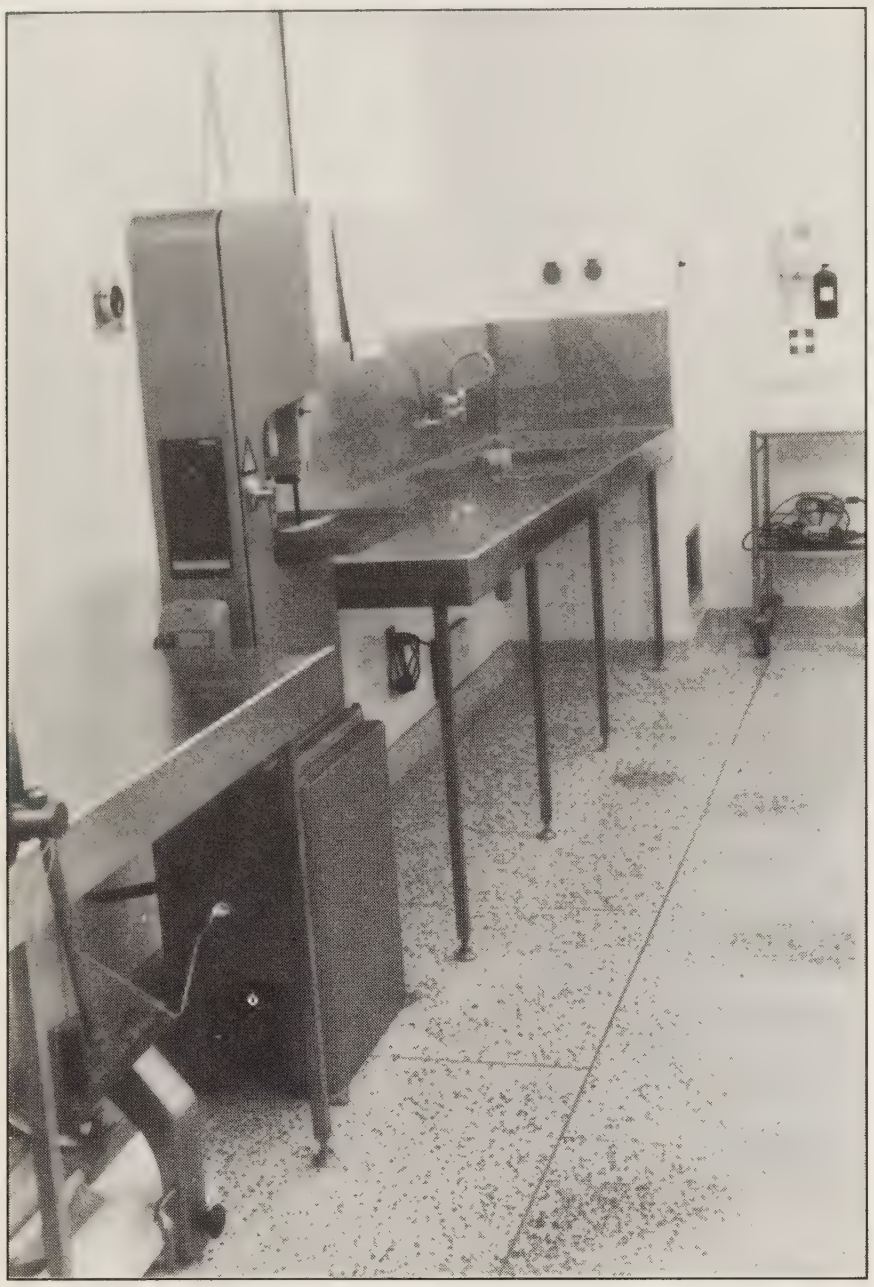


Dissecting bench: the bench should have a slope to a sink.

4.22 The walls should be finished with a hard and durable surface, impervious to liquids and resistant to disinfectants. The floor should be hard-wearing, non-slip and radiused at the junction with the walls. A fall allowing efficient drainage to floor channels or gullies is essential,

* To date, "down-draught ventilated" post-mortem tables have not been demonstrated to offer microbiological improvement of the environment over the conventional room ventilation system described in Chapter 6. They will be more expensive, and may be difficult to instal, clean and service. They may provide some measure of control against odours, but installation and associated cost implications will need to be carefully considered: these include the need to perforate the floor slab and floor finishes to accommodate the ventilation ducting; the possibility of external corrosion of, and condensation within, the ducting; access for cleaning and maintenance, and eventual replacement of the ducting.

together with a totally waterproof surface, because hosing down is a frequent activity.



The dissecting bench

Dirty utility/Instrument store/Cleaners room

4.23 This room should open directly off the post-mortem room. It serves as a dirty utility room and for the cleansing and disinfection of instruments after use and their storage. Chemical solutions may also be prepared or dispensed in this room, according to local policy. An autoclave should be provided in this room for sterilizing instruments unless sterilizing facilities are provided elsewhere.

4.24 A sink will be required for washing and disinfecting bowls and instruments. Waterproof aprons will also be washed in this room and facilities are needed for them to be hung to dry.

4.25 The reserve stock of instruments, unused specimen jars, and chemical solutions will be held in this room.

4.26 Cleaning equipment for use in the post-mortem room and body store should be kept in an en-suite cleaners room. This space should have general cleansing facilities as described for the cleaner's room provided for the rest of the mortuary (see paragraph 4.37).

4.27 A wash basin with elbow action controls is needed. A flushing sluice may be sited in this room or immediately outside it within the post-mortem room.

Transit area/Staff changing

4.28 Staff entering the post-mortem room will need to wear protective clothing. Staff access to and from the post-mortem room will be by way of a transit area, which separates the work in the post-mortem room from offices and other clean areas. The area will contain storage for a supply of clean protective clothing and a rack for clean rubber boots etc. Two identical sets of WC/shower and locker facilities should be provided opening into this area to allow for flexible use, identified as required for both sexes or different staff groups according to local policy.

4.29 Entrances to the post-mortem room from the body store and transit area should be demarcated by red lines on the floor. These lines are simply a reminder to staff of the need for a change of footwear when crossing from one area to the other. There must be shelves in the post-mortem room, near each entrance, for clean, easy slip-on footwear. After use, boots will be left on the floor or in a trough beneath the shelves for cleaning and disinfection. Provision must be made near the exit from the post-mortem room or alternatively in the transit area for staff to discard contaminated external protective clothing and gloves and for hand washing. Hand washing facilities are required near to the doors to the body store and also near to the exit to the transit area.

Observation area

4.30 Each post-mortem room requires a defined area for clinical staff to observe an autopsy examination. It is necessary to make this provision in such a way that observers do not need physically to enter the post-mortem room. The only entrance should, therefore, be from outside the post-mortem room. Demonstration of pathological findings in organs is to be expected, so a dissecting bench should be provided along the wall of the post-mortem room adjoining the observation area. An angled glass divider will provide protection to viewers from splashes during the demonstration of findings. This arrangement should suffice for up to six or eight people. For groups larger than this consideration should be given to the provision of a raised step or a tiered area.

Observation area

4.31 Air should be supplied to the observation area, to contribute to the control of air movement within the post-mortem room as a whole (see paragraphs 6.36-6.37). The ducting from the linear exhaust ventilation grille at the rear of the dissecting bench can be incorporated into the divider separating the viewing area from the post-mortem room.

Specimen store

4.32 It may sometimes be convenient to keep organs and body tissues obtained at post-mortem examination temporarily in the mortuary rather than in the pathology department where they will be studied further. Shelves of impervious material will be required for jars or containers of various sizes. Floor space, or space below high benching, will be required for formalin containers. The room must be continuously ventilated because of the hazard arising from formalin used in the specimen containers. (See paragraphs 3.8 to 3.10 and 6.44 to 6.45.) Dissection of fixed tissue would normally be undertaken in the histopathology department at an appropriately ventilated bench. Alternatively, some work, eg slicing of brain, may take place at a dissecting bench in the post-mortem rooms (see paragraph 6.39).

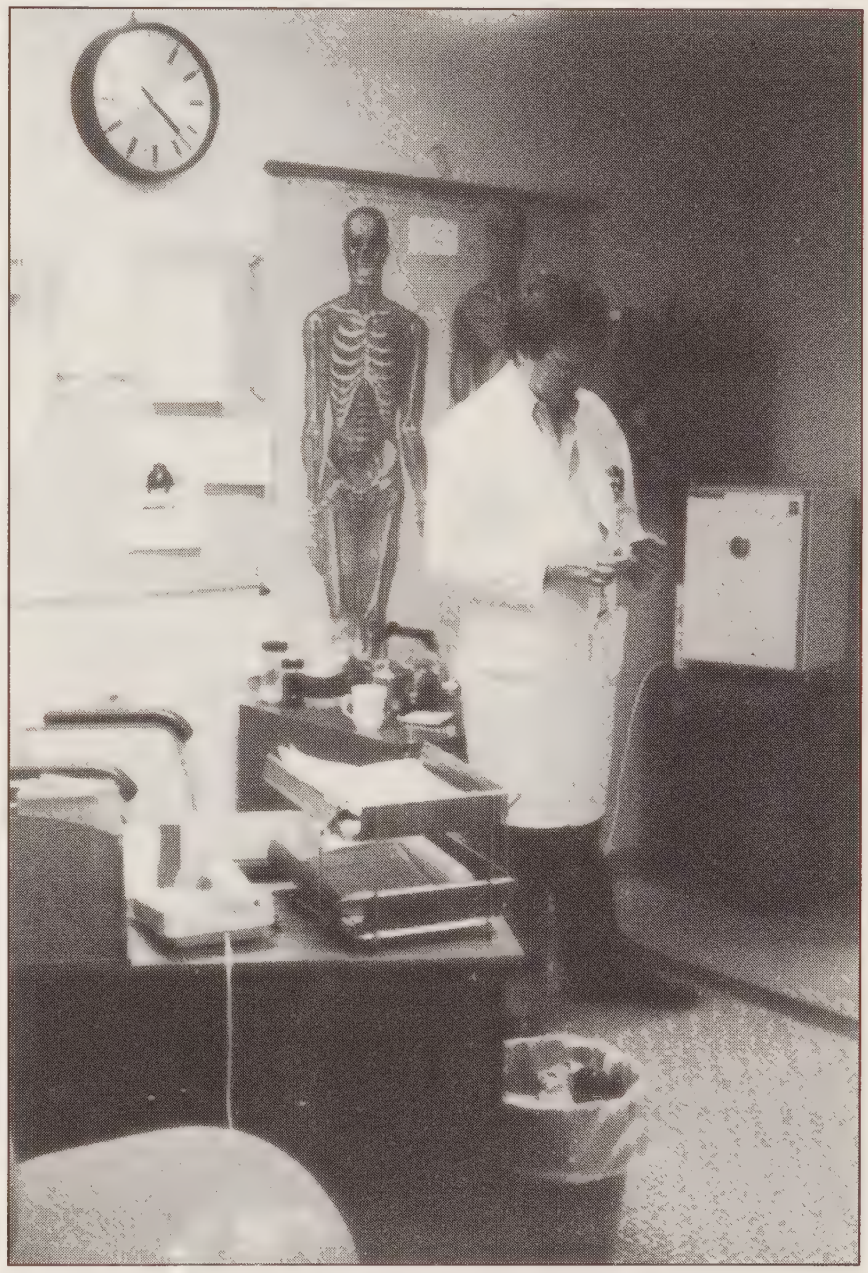
Offices

Pathologists' office

4.33 The function of this office is to provide space for consultations and writing reports. It should be provided with a window for natural ventilation, and it should be entered from the circulation route leading to the transit/changing area and the body store. (See paragraph 2.18 for staff changing requirements.)

Technicians' office/Rest room

4.34 This room should have access to the viewing suite and should be situated near the body store and the undertakers' entrance in order that bodies may be registered and labelled before being deposited in the body store. It should be entered from the circulation route leading to other parts of the mortuary. The staff call bells for undertakers and visitors will need to be located here (see paragraph 3.54.b). Apart from clerical functions, the office will be used for relaxation between work periods. It should be furnished with a desk, chairs, shelves and filing cabinet. An external window, and one which overlooks the body store lobby, should be provided. Provision should be made to enable technicians to store clothing and personal effects in this room. (See paragraph 2.18 for staff changing requirements.)



Technicians office/rest room

4.35 As far as possible, staff should use catering facilities provided in the hospital. Where local policy determines a need for the occasional preparation of beverages by staff, a beverage preparation point should be provided in the technicians office/rest room. Beverage preparation and consumption must be strictly confined within the offices.

Disposal room

4.36 The disposal of used items will depend on whole hospital policy but will be in accord with the Health

Services Advisory Committee and Health and Safety Commission's document on 'The Safe Disposal of Clinical Waste'. A room for the temporary holding of securely packed refuse and dirty linen bags (appropriately colour coded) should be provided with easy access for their collection.

Cleaners' room

4.37 A cleaners' room should be provided to service the whole accommodation, except the post-mortem room, the body store, and the dirty utility/instrument store (see paragraph 4.26). There should be lockable cupboard space for secure storage of stock and shelves for holding in-use materials. There should be adequate space for manoeuvring machines, the emptying/filling of buckets and bowls, and the routine servicing and cleaning of equipment. There should be unrestricted access to the sink, and to a wash-hand basin.

General purpose and linen store

4.38 A general purpose store will be needed for a wide variety of stock items and linen which do not require specialised environmental conditions. As stock dimensions vary considerably, adjustable shelving will be an advantage. Adequate floor space should be allowed for the storage of bulky goods. Good natural or mechanical ventilation is required.

4.39 Arrangements for supplies and storage facilities will be in accordance with Whole Hospital policies for supplies and associated services. Storage is required for clean supplies of general utility and toilet items and for linen, including drapes, shrouds, white coats, protective clothing, disposable items, towels and other linen, and for the reserve stock of cleaning materials.

4.40 The store must be accessible to staff for servicing both the body store and viewing room, and the post-mortem room activity requirements.

5.0 General guidance

Introduction

5.1 This Chapter contains guidance concerning aspects of function and design which are common to health buildings generally and which will need to be borne in mind when designing new buildings or upgrading existing premises.

Economy

5.2 The planning of hospital buildings requires design solutions which not only satisfy functional requirements but also ensure maximum economy in respect of both capital and running costs. Due weight must therefore be given to the questions of space provision, maintenance (including cleaning), energy consumption and staffing requirements.

5.3 Planning should ensure that spaces are used as intensively as possible and are not unnecessarily duplicated. To ensure that there is no over-provision of new accommodation, project teams should first evaluate the utilisation of similar existing facilities in relation to their workload and staffing.

Upgrading or adaptation of existing buildings

5.4 The standards set out in this guidance essentially apply to the provision of accommodation by new building and it is not intended that they should be applied retrospectively to existing stock. However, the principles are equally valid and should be applied, so far as is reasonably practicable, when existing accommodation is being upgraded or new accommodation is being constructed within an existing building which may previously have been used for other purposes.

5.5 The cost of upgrading work should conform to the guidelines indicated in the Department's WKO letter (81)4 (in Wales, AWO(81)8). These guidelines take into consideration the estimated life of the existing building and the difference in cost between upgrading a building and new building.

5.6 Before any decision is made to carry out an upgrading project, consideration must be given to the long-term strategy for the service; the space required for the new service, and the size of the existing building. Regard must also be paid to the orientation and aspect of the building and the adequacy and location of all necessary support services.

5.7 If there emerges a prima facie case for upgrading, a thorough analysis of all functional and physical conditions of the existing building should be undertaken.

5.8 When comparing the cost of upgrading or adapting an existing building to that of a new building, in addition to the building cost, due allowance must be made for the cost of relocating people, demolition and salvage costs, disruption of services in a phased project, and the temporary effects on running costs of any impaired functioning of areas affected by upgrading.

5.9 The check of physical and other aspects of existing buildings should include:

a. availability of space for alterations and additions;

b. type of construction;

c. insulation;

d. age of the buildings, condition of fabric, eg external and internal walls, floors, roofs, doors and windows, which may be determined by a condition survey;

e. life expectancy and adequacy of engineering services, ease of access and facility for installation of new wiring, pipework and ventilation systems, if required;

f. the height of ceilings (high ceilings do not necessarily call for the installation of false ceilings, which are costly and often impair natural ventilation);

g. changes of floor levels to avoid hazards to disabled people and in the movement of trolleys (see paragraphs 3.49 and 5.25);

h. fire safety (see paragraphs 5.14 - 5.17);

j. physical constraints to adaptation, such as load-bearing walls and columns.

5.10 Having decided that existing health premises are suitable for upgrading or conversion, the main requirement will be to assess how the accommodation can be adapted so as to facilitate good practice.

5.11 The main environmental factors which should be considered are the same as for new building - see Chapter 3, and paragraphs 5.2 and 5.14 et seq.

5.12 Upgradings must conform to current fire safety and other statutory regulations. It is very difficult to estimate the fire resistance of floors, walls and doors of existing buildings.

5.13 This summary of the main aspects of upgrading is general in character and it is recognised that each upgrading project will present its own individual problems. In many instances, compromises may have to be made between Building Note standards and what it is possible to achieve. Upgradings should be functionally sound - not merely cosmetic - and appropriate for the projected needs for a number of years to come.

Fire precautions

5.14 It is essential that project teams familiarise themselves with the guidance contained in the FIRECODE suite of documents which contain the Department's policy and technical guidance on fire precautions in hospitals and other NHS premises. In particular, the need for structural fire precautions and means of escape from the whole accommodation must be taken into account at the earliest possible planning stage. The key document for these aspects in hospitals is 'FIRECODE : Fire precautions in new hospital's', Health Technical Memorandum 81.

5.15 In addition, basic policy, principles and key management guidance are contained in 'FIRECODE : Policy and principles'. Other FIRECODE documents include the Health Technical Memoranda '80' series (which give technical guidance on various building, engineering and equipment issues), the Fire Practice Notes series (dealing with various specialist aspects of fire precautions) and Nucleus guidance. Existing HTMs will, in due course, be re-issued in FIRECODE format.The series includes 'FIRECODE:Directory of fire documents' which lists references to relevant legislation and relevant fire precautions guidance issued by the Department of Health and other sources, eg the Home Office. Publications in the HTM '80' series are listed in the Bibliography at the end of this Note.

5.16 It is important to establish during the design stage those aspects of fire safety strategy which affect the design, configuration and structure of a project. At appropriate stages of the design process, the architect and engineer should discuss and verify their proposals with the local fire authority, and ensure that the project team and all other planning staff are fully acquainted with the fire safety strategy for the design in terms of operation (staff responsibilities etc), equipment provision and buildings and engineering layouts. Health Technical Memoranda 57, 58, 59 and 60 give detailed information for the selection of fire resisting components.

5.17 The principles of fire safety apply equally to new projects and to alterations and upgradings of existing buildings.

Critical dimensions

5.18 Appendix 1 contains information on critical dimensions for some of the activities mentioned in this Note which are not included in Health Building Note 40 – 'Common Activity Spaces'.

Information technology in the NHS : provision for Automatic Data Processing

5.19 Computing expertise is now widely available in the NHS and project teams should ensure that, at an early stage, they inform themselves concerning current and projected local computing policies, and that their proposals conform with them.

Component Data

5.20 The Component Data Base consists of a series of HTMs which provide specification and design guidance on building components for health buildings.

5.21 The HTMs in the series are listed in the Bibliography at the end of this Note.

5.22 In its previous forms, the Component Data Base contained specifications and design guidance together with lists of selected components or firms producing those components for use in health building. No firms or products are now listed.

5.23 The technical information in this series is the result of research and development funded by the Department of Health as part of collaborative working arrangements over a number of years between the Department, the NHS, and industry, through the medium of the Component Data Base, managed by a steering group staffed mainly by NHS professionals.

Damage in health buildings

5.24 When designing and equipping health buildings, the likely occurrence and effects of accidental damage should be considered. Damage in health buildings has increased over the years through the use of heavier mechanical equipment for the movement of patients and supplies

and, to some extent as a result of light-weight, often less robust, building materials. Most damage to doors, and to floor and wall surfaces, is caused by wheeled traffic. Measures to minimise damage should be taken in the form of protective corners, buffers and plates, and to proper continuation of floor coverings, ie strong screeds and fully bonded floor coverings. Protective devices should be capable of being renewed as need arises. Reference should be made to the relevant British Standards, to the advice in the Department's DS (Supply) letter 42/75 on the buffering of movable equipment, and to the guidance contained in Health Building Note 40 – 'Common Activity Spaces Volume 2 Corridors'. Further information is provided in Health Technical Memoranda 56, 58 and 61.

Disabled people

5.25 It is essential to ensure that suitable access and facilities are provided for disabled people who have problems of mobility or orientation. This includes, besides the wheelchair-bound, those who for any reason have difficulty in walking and those with a sensory handicap such as a visual or hearing impairment. Authorities are reminded of the need to comply with the provisions of :

The Chronically Sick and Disabled Persons Act 1970;

The Chronically Sick and Disabled Persons (Amendment) Act 1976;

The Disabled Persons Act 1981;

The Disabled Persons (Services, Consultation and Representation Act) 1986;

The Building (Disabled People) Regulations 1987.

Attention is also drawn to BS5810:1979 'Access for the Disabled to Buildings' (under review). One of the effects of the 1981 Act is to apply this British Standard to premises covered by the 1970 Act, which includes those open to the public. Practical guidance for complying with the Building (Disabled People) Regulations is issued by the Department of the Environment under Approved Document 'M' : 'Access for the Disabled'.

5.26 Project teams are encouraged to refer to Health Building Note 40 – 'Common Activity Spaces Volume 4 Designing for disabled people'. This gives guidance and a set of ergonomic data sheets on access, space and equipment relating to disabled people in health buildings.

5.27 If public telephones are provided in the department, the telephone equipment/handset should be fitted with an inductive coupler to assist people using a hearing aid.

6.0 Engineering services

Introduction

6.1 This Chapter describes the engineering services contained within the accommodation described in this Note, and their possible integration with the engineering systems serving a whole site. Its purpose is not to inhibit the design solution but to acquaint the engineering member of the multi-disciplinary design team with the design criteria, material specifications, and reference data needed to meet the functional requirements.

6.2 Documents referred to by number, eg [10], are listed at the end of this Chapter. They are numbered in order of first appearance, repeated references retaining the same number.

Model specifications

6.3 A series of model specifications for the specialised engineering services in health care buildings have been issued nationally and are sufficiently flexible to reflect local needs. The cost allowance for the engineering services in each functional unit of this department is based on the qualities of material and workmanship described in the relevant parts of the model specifications.

Economy

6.4 Engineering services are a significant proportion of the capital cost and thereafter remain a continuing charge on revenue budgets. The project design engineer should therefore ensure not only utmost economy in initial provision, consistent with meeting the functional requirements and maintaining clinical standards, but also the optimum benefit from the total financial resources these services are likely to absorb during their lifetime.

6.5 Where alternative design solutions are available, their consequential capital and running costs should be compared using option appraisal techniques [1] so that due consideration is given to the need for, and the costs of, maintenance and the eventual replacement of plant and equipment.

6.6 The economic appraisal of alternative design solutions should include the heat conversion and distribution losses at the point of use. Where buildings are located remote from the development's load centre, these losses can often equal the useful energy consumed.

6.7 In any new project, consideration should be given to energy management and to the facilities offered by a whole hospital control system to enable some measure of energy accounting to be exercised at departmental level.

6.8 After satisfying the Building Regulations[2] on the standards of thermal insulation provided, consideration should be given to the economics of additional insulation to the ground floor slab and to the roof (see Engineering Data Sheet CE7[3]), particularly where accommodation is located in a building of low-rise construction. Where there is a solidly constructed ground floor, the inclusion of floor insulation will also contribute to staff comfort. Guidance concerning the economic thickness of thermal insulation relative to the cost of energy, 'K' values, temperature differences, capital costs and hours of use is given in Engineering Data Sheet CE11 [4].

6.9 Similarly, in view of the increasing costs of generating heat energy, consideration should be given to the economies of appropriate equipment for recovering some of the value of the energy which would otherwise be discharged by mechanical ventilation systems and also for programmed turning-off, or reduction, of heating and ventilation in those spaces used only for part of the day.

Maximum demands

6.10 User demand on engineering services is often difficult to predict, but experience indicates that services designed for simultaneous peak conditions are seldom fully utilised in practice. The estimated maximum demand and storage requirement (where appropriate) for each engineering service in this accommodation will need to be assessed individually to take account of the range, size and shape of the functional units, geographical location, operational policies and intensity of use. As a guide, and for preliminary planning purposes only, the following are the estimated maximum demands for a mortuary comprising a 12-chamber body store, three deep-freeze chambers, and a two-table post-mortem room, together with facilities for relatives.

Service	Typical Max demand	Notes
Heating/ventilation (kW)	48	
Cold water (litre/sec)	1.65	storage 2300 litres (24 hour supply)
Domestic HWS (litre/sec)	1.60	storage 1200 litres (2 hours recovery)
Supply ventilation (m^3/s)	0.85	
Extract ventilation (m^3/s)	1.28	
Electrical (kVA)	44	includes 11kVA essential
Fuel gas	No requirement	
Steam	No requirement	
Medical gases	No requirement	

Space requirements for services

6.11 The satisfactory performance of plant in health care buildings is particularly important and the design should allow for ease and safe means of access and space for the necessary frequent inspections and maintenance and for eventual removal and replacement. As far as practicable, however, this access should be protected from unauthorised entry.

6.12 Recommended spatial requirements for mechanical, electrical and public health engineering services in health buildings are given in Health Technical Memorandum (HTM)23 [5]. The information in HTM 23 is specifically intended for use during the initial planning stages when precise dimensional details of plant are not available.

6.13 The distribution of mechanical and electrical services to final points of use should, wherever possible, be concealed in walls and above ceilings. Heat emitters should be contained within a 200mm wide perimeter zone under window sills and critical dimensions should be taken from the boundary of this zone. For costing purposes the 200mm zone, which includes the floor area occupied by minor vertical engineering ducts, is included in the building circulation provision.

Activity Data

6.14 User requirements, environmental conditions and equipment arrangements, as described in the Activity Data Sheets (see Chapter 8) should be referred to when positioning service components and outlets.

Safety

6.15 Section 6 of the Health and Safety at Work etc Act 1974[6], as amended by Schedule 3 of the Consumer Protection Act 1987 [7], imposes statutory duties on all persons who design, manufacture, import, supply, install or erect "articles for use at work". One of the requirements of this section is to ensure, so far as is reasonably practicable, that the article is so designed and constructed that it will be safe and without risks to health at all times when it is being set, used, cleaned or maintained by a person at work. All parts of engineering systems are covered by the term "articles for use at work" and designers of these systems for health care premises must therefore fulfill their statutory obligations.

Fire safety

6.16 Design guidance for the fire safety requirements in new hospitals is given in HTM 81[8]. Technical information concerning the design and specification of fire detection and alarm systems is detailed in HTM 82[9], which also replaces or modifies certain clauses of BS5839 Part 1[10] to meet the needs of health care premises. More general advice on fire prevention is given in HTM 83[11].

6.17 The design of the engineering services should accord with the recommendations in the above series of HTMs and the engineer should verify his proposals in accordance with the procedure described in paragraphs 5.16 and 5.17.

Noise

6.18 Excessive noise in the individual areas, whether internally or externally generated and transmitted, can adversely affect the operational efficiency of the department and can cause discomfort. The limits and means of control advocated in Hospital Design Note 4 [12], including its revisions [13], and the means of control given in Engineering Data Sheet DH1 [14], should provide an acceptable acoustic environment. In addition to designing for control of noise levels, there may also be a need to ensure speech privacy, ie that confidential conversation is unintelligible in adjoining rooms or spaces. The acceptable noise level and, where applicable, any requirement for

speech privacy in the individual spaces in this department is shown on the Activity Data A-Sheets.

Control access

6.19 Primary engineering distribution control and isolation devices must be protected against unauthorised operation, eg any switchgear and fuse-boards not located in the departmental switchroom (see paragraph 6.63) should be housed in secure cupboards. These should be located in circulation rather than working areas.

Engineering commissioning

6.20 It is most important that engineering services should be fully commissioned. HTM 17[15] describes the requirements which should be included in the design and construction contract documents. Flow measurement and proportional balancing of air and water systems requires adequate test facilities, eg orifice plates, venturi valves etc. to be incorporated at the design stage.

MECHANICAL SERVICES

6.21 The mechanical services include the provision of heating and ventilation, and domestic hot and cold water. For cost allowances purposes, the distribution of these services is deemed to commence at their points of entry into the department and includes ductwork, pipework, fittings, controls and connections to equipment and terminal outlets. Ventilation plant associated with the mortuary and post-mortem room is included in the departmental cost allowance.

6.22 The mechanical services also include the provision of refrigerated body storage cabinets and all necessary refrigeration plant. The number of body store compartments to be provided will be indicated in the Activity Data Sheets.

6.23 The environmental requirements in individual spaces will also be shown in the Activity Data Sheets. Recommended room temperatures, air change rates, hot water service temperature etc are grouped under "Technical Design Data" on each A-sheet. The B-sheets give the disposition of engineering outlets for the activities described.

Heating

6.24 General space heating requirements can usually be met by low pressure hot water radiators operating as a sub-system from the primary heating distribution system.

6.25 Radiators should normally be located under windows or against exposed walls, with sufficient clear space between the top of the radiator and the window sill to prevent curtains reducing the output, and adequate space below to allow cleaning machinery to be used. Where a radiator is located on an external wall, back insulation should be provided to reduce the rate of heat transmission through the building fabric.

6.26 It is recommended that overhead radiant heating panels be used in the post-mortem room, the body store and associated dirty utility room because these areas require frequent washing down and decontamination. Pipework within these rooms should be concealed wherever possible, with adequate access for maintenance. These concealment and access arrangements should not form traps where water or debris may accumulate and they should be easy to clean. Floor service ducts should be avoided.

Temperature control

6.27 To facilitate overall temperature control the heating system flow temperature should normally be varied via an external compensator and thermostatic valves should be installed on all heating appliances. These valves should be of robust construction and selected to match the temperature and pressure characteristics of the heating system. The thermostatic head, incorporating a tamper-proof facility for presetting maximum and minimum room temperature, should be controlled via a sensor located integrally or remotely as appropriate.

Ventilation

6.28 Recommendations for the ventilation of individual spaces in this department are shown on Activity Data A-Sheets.

6.29 Mechanical ventilation systems are expensive in terms of capital and running costs and planning solutions should be sought which take maximum advantage of natural ventilation. It is acknowledged that planning constraints imposed by the building shape and/or the functional relationship of specific spaces will often result in some measure of enclosed internal areas. Ventilation costs can, however, be minimised by ensuring that, wherever practicable, core areas are reserved for spaces that require mechanical ventilation irrespective of whether their location is internal or peripheral. Examples are sanitary facilities, rooms whose functional requirements have specific environmental needs, or spaces where windowless accommodation is acceptable. Other spaces appropriate to

core areas are those which have only transient occupation and therefore require little or no mechanical ventilation. Examples are circulation and some storage areas.

6.30 Mechanical ventilation should generally be arranged to encourage uniform air movement within the space. The design should allow for an adequate flow of air into any space having only mechanical extract ventilation. Transfer grilles should be provided in doors or walls to connect such spaces to either naturally ventilated corridors or other spaces with mechanical air supply. Such arrangements, however, should avoid the introduction of untempered air and should not prejudice the requirements of fire safety or privacy.

6.31 Ventilation supply plant should include air filters having a minimum arrestance of 85% and a minimum average dust spot efficiency of 25%, when tested in accordance with BS6540, Part 1 [16]. Filters must be readily accessible for replacement and maintenance purposes, and be provided with a pressure-differential indicator in addition to the "filter fault" alarms described in paragraph 6.50. Coarse pre-filters may be necessary where the intake air is exceptionally polluted. Heater batteries should be sized for the ventilation requirements only, ie not the building fabric loss.

6.32 External discharge arrangements for extract systems should be protected against back pressure from adverse wind effects and located to avoid re-introduction of exhausted air into the building through air intakes and windows. Special consideration will need to be given to the exhaust air from the post-mortem suite. This should be discharged outside the building at a point where odours will dissipate to atmosphere without causing offence or discomfort to occupants of the hospital and others. In particular, care must be taken to ensure that odours do not re-enter hospital buildings or discharge to public places, especially at ground level.

6.33 Filtration on the extract system in the post-mortem room is not considered to be necessary and no provision is included in the cost allowance for extract system filtration.

Ventilation of post-mortem suite

6.34 The post-mortem room, observation area and the body stores, together with the associated dirty utility room and staff changing/transit area, should have a supply and extract ventilation plant dedicated to this suite of accommodation.

6.35 The ventilation of this suite should be arranged so that air flows towards the post-mortem room from the adjoining transit area/staff changing area and the body storage area. This will usually be achieved by air leakage via the doors between the post-mortem room and these spaces. The ventilation of the dirty utility/instrument store should be arranged so that this space is at a negative pressure in relation to the post-mortem room to minimise possible diffusion of offensive odours back into the post-mortem room.

6.36 The fresh air supply to the post-mortem room should be introduced at high-level directly above the observation area and at appropriate positions in the post-mortem working area in a manner which avoids discomfort to staff and observers, and also does not affect the localized air flow pattern provided by the extract grilles at the dissecting positions. The recommended total fresh air supply rate to the post-mortem room is 10 air changes per hour, including the proportion of this being supplied via the observation area.

6.37 Air from the post-mortem room should be extracted by means of a linear grille situated behind each dissecting position, and other grilles at low level. In order to ensure that an acceptable air movement occurs between the post-mortem room and the associated spaces comprising the post-mortem suite (as described in paragraph 6.35), the recommended total extract rate from the post-mortem room is 12 air changes per hour, including the air extracted at the dissecting positions.

6.38 Published data regarding acceptable performance standards for containment of formaldehyde vapour at dissecting benches below the TLV of 2 ppm is not generally available. The guidance given in the following paragraphs is based on the results of Department of Health-commissioned tests on a model installation and is aimed at maintaining a concentration below 1 ppm. This is the basis for the cost allowances promulgated with this Note. It is recommended as a solution, but does not preclude the consideration of any other system or equipment for which supporting evidence is available to demonstrate comparable performance.

6.39 Each dissecting position will usually be accommodated in a continuous run of benching which should not be more than 650mm from front to rear and which should be provided with a continuous upstand at the rear. Each dissecting position should have a linear extract grille mounted with its face flush with the upstand.

6.40 The bottom of the grille should be as close as practicable to the level of the working surface. For practical cleaning purposes, the minimum height of the bottom of the grille opening above the working surface is likely to be 75mm.

6.41 In practice, a working zone 1.2m long should suffice at each dissecting position. It is recommended that the extract grille should also be 1.2m long and 150mm high. For optimum extract performance, it should be mounted

on a purpose-designed plenum box (incorporating guide vanes as necessary) to ensure that, as far as practicable, there is a uniform face velocity of not less than 1m/s along the total length, and across the full height, of the extract grille opening. The grille should be readily demountable to permit periodic internal cleaning of the plenum box and any guide vanes.

Bandsaw extract

6.42 When a bandsaw is installed in the post-mortem room, it should be provided with its own local swarf extraction plant. This will have the effect of marginally increasing the total extract rate above the value specified in paragraph 6.37 for the periods during which the bandsaw is in use. It is recommended that no attempt be made to adjust the mechanically ventilated air supply rate into the post-mortem room during these periods.

6.43 The discharge from this plant should be filtered locally prior to connecting into an extract system, and should not be allowed to recirculate into the post-mortem room space. It is recommended that this exhaust is separately ducted to a safe place outside the building, rather than into the post-mortem room extract ventilation system, to avoid the possibility of main ductwork and plant contamination and the need for consequential cleaning and maintenance.

Ventilation of specimen store

6.44 Continuously operating extract ventilation to the specimen store will be required. This may be connected to the hospital main extract system.

6.45 An air flow switch should be incorporated into the extract branch connection serving the specimen store. When an air flow is established within this branch, the air flow switch should energise a light over the specimen store door, which should remain illuminated only while the air flow is maintained. A notice should be provided on the specimen store door warning not to enter the store unless the light is on.

Ventilation of visitors' sanitary accommodation

6.46 A separate extract system will be required for the visitors' sanitary facilities. This may be connected to the main hospital toilet extract system. If this is not practicable, a dual motor and fan unit with an automatic changeover facility should be provided. This system should ensure that, when the department is in use, this sanitary accommodation is maintained at a negative pressure in relation to the adjacent visitors' waiting area but does not draw air from the post-mortem suite described in paragraph 6.34.

Ventilation of dirty utility

6.47 The extract system in this room should include a linear extract grille positioned above the work bench to achieve control of formaldehyde fume when dilute formalin solutions are being made up. The general criteria for sizing and positioning described in paragraphs 6.39 - 6.41 may be applied except that a grille length of 0.6m will usually be sufficient.

Ventilation controls and alarms

6.48 The supply and extract ventilation system for the post-mortem suite should include local controls and indicator lamps in the post-mortem room to confirm the operational status of the system. These manual controls should be provided with labels clearly defining their function. This ventilation system should be controlled by means of a timeclock with a limited period manual override facility located within the department (see paragraph 3.44).

6.49 The supply and extract fans to the mortuary and post-mortem suite should be interlocked so that the supply fan will not operate unless an air flow is established within the extract system.

6.50 Alarms should be provided in the post-mortem room to show "filter fault" and "low air flow". The "filter fault" alarm should be initiated by a predetermined increase of pressure differential across the filters, thereby indicating a dirty filter or end of roll. The "low air flow" alarm should be initiated when the supply air quantity falls to around 80% of the design value to give indication of fan failure, closed dampers, plant access doors left open or any other eventuality that could cause a reduction of supply air quantity.

6.51 All primary heater battery coils should be provided with frost protection.

Hot and cold water services

6.52 The domestic hot water supply should be taken from the general hospital calorifier installation at an outflow temperature of 60°C ± 2.5°C, and distributed to all outlets so that the return temperature at the calorifier is not less than 50°C.

6.53 Guidance concerning cold water supply pipework and distribution systems is given in HTM 27[17]. For frost protection purposes and to prevent condensation staining decorative finishes, all cold water pipework, valves and flanges should be insulated and vapour sealed.

6.54 To control Legionellae, the water services should be designed, installed and commissioned in accordance with the recommendations in the DHSS Code of Practice [18].

6.55 The hot and cold water service fittings in the post-mortem room, body store and sluice room should be segregated on their own sub-circuit. Appropriate arrangements against back syphonage to any other water systems must be provided on these sub-circuits.

6.56 All taps in the working area should be elbow operated. Post-mortem tables should be fitted with individual low pressure water hoses, the hoses being supplied with temperature controlled water from a thermostatically controlled mixing valve sited in the post-mortem room. Water suction pumps should not be used. Floor service ducts should be avoided.

Refrigerating plant and body storage chambers

6.57 The refrigerating plant should be housed in a well-ventilated plant room suitable for one or more air-cooled compressors mounted on a brick or concrete plinth to facilitate servicing. The size of this room will depend upon the number of body storage spaces required. In practice, a body is stored in its own cold chamber and a vertical bank of three chambers usually forms a construction module of one refrigerated compartment. A plant room size of 3m x 2.5m should be sufficient for up to six body chambers (ie two compartments) and three deep-freeze body chambers (ie one compartment). A plant room size of 4m x 2.5m should be sufficient for up to 18 body chambers and three deep-freeze chambers. These sizes should also allow for the accommodation of the electrical switchgear and distribution boards etc. External access to the plant room is required for servicing and maintenance.

6.58 The direct expansion cooling coils should be capable of reducing the temperature of the chambers and contents to 4°C within 10 hours from being loaded with bodies at a temperature of 37°C, when the external air temperature is 30°C and the initial temperature of the chambers, before loading, is 6°C.

6.59 Unless defrosting is incorporated into the system, defrosting of the coils should be allowed for at the rate of once every seven days. Suitable drainage trays connected to piped drains will be required. The pipes should be protected by electrical tracer heating where the temperatures are likely to fall below freezing point. The refrigerant should be non-toxic.

6.60 The construction and insulation of the cold chambers should ensure that the running time does not exceed 18 hours per day, with normal or average periods for door opening. Door fastenings should be operable from both inside and outside the chambers. If a circulating fan is employed, it should be stopped by a door switch when the door is opened. It is recommended to provide a neon indicating lamp outside each chamber to indicate that its associated fan and compressors are working. Fittings in the chambers should be heavily galvanised. Lighting fittings should also be splash proof. Thermostatic control will be required for each chamber. Facilities should be provided locally at the body store to enable chambers not in use to be switched off.

ELECTRICAL SERVICES

6.61 The electrical installation will include main intake switchgear and wiring and equipment for lighting, power, environmental plant and earth bonding of extraneous metalwork. Extensions from central systems for telephones, fire alarms and, possibly, staff location/call services, will also be required. These installations should comply in all respects with the current IEE Regulations for Electrical Installations [19] and conform to the requirements of HTM 7 [20].

6.62 Reference should be made to the Activity Data Sheets for the recommended levels of internal illumination, disposition of outlets for power, telephones, call systems, and clocks etc in individual spaces.

6.63 The point of entry for the electrical supply will be a departmental switchroom housing the main isolators and the main distribution equipment. The switchroom will also be the distribution centre for subsidiary electrical services and apparatus, with the exception of the safe supply unit (see paragraph 6.79). All equipment should be mounted at a height to give easy access from a standing position. The switchroom should be positioned so as to minimise the cost of cabling required to serve the department. In practice this electrical switchroom will normally be combined with the body stores refrigeration plant room.

Electrical installations

6.64 The electrical installation in occupied areas should be concealed using PVC insulated cable in screwed steel conduit or trunking, but in certain circumstances, mineral insulated copper covered cables may be necessary. External installations should comprise PVC insulated cables in galvanised screwed steel conduit with fittings of

weatherproof pattern. Steel conduit and trunking wiring ways for communication systems should also be concealed wherever possible.

Electrical interference

6.65 Guidance concerning the avoidance and abatement of electrical interference is given in HTM 14[21] and fluorescent luminaires (lighting fittings) should comply with BS5394[22].

6.66 Care should be taken to avoid mains borne interference and electrical radio frequency interference affecting computers and other electronic equipment used here or elsewhere on a hospital site.

Lighting

6.67 Practical methods of lighting the various functional spaces are contained in the CIBSE Lighting Guide LG2[23]. The choice of luminaire should take account not only of the requirement of light distribution and visual comfort appropriate to the space, but also the operating efficiency of the light source used. Luminaires should be of types which are easily cleaned and maintained and are manufactured and tested in accordance with the requirements specified in the relevant sections of BS4533[24]. Their location should be readily accessible for lamp changing and maintenance, but with the overriding requirement that the recommended standard of illuminance is provided to the task areas. Luminaires using fluorescent lamps should be installed when artificial lighting is required for long periods or where areas are devoid of natural light. Intermittently used luminaires may be fitted with incandescent or compact fluorescent lamps.

6.68 Control of lighting is normally by local switches and these should be provided in sufficient numbers to allow variation in lighting options, eg reduced levels of illuminance when circumstances permit, and to encourage energy conservation. Dimmable lighting controlled by electronic dimmers should be provided only where indicated on the Activity Data Sheets.

6.69 In the post-mortem room and body stores, the general lighting luminaires and their associated switches should be splash-proof (as classified in BS5490)[25].

6.70 Ceiling-mounted examination luminaires should be provided above each post-mortem table. These should operate at extra low voltage, be totally enclosed, and be equipped with a heat filter. The temperature of external surfaces must be such as to avoid injury to staff. The luminaires should comply with the requirements of BS4533: Part 102.55[26] and be in accordance with the performance specification of Type B included in BS4533: Part 103.2[27]. It will be difficult to obtain these luminaires to splashproof classification and it is therefore essential to ensure that the transformer is located within the ceiling mounting enclosure so that it is out of reach from floor level.

6.71 The lighting of corridors, stairways and other circulation areas, which generally are areas not covered by Activity Data Sheets, should be in accordance with the guidance contained in HBN 40 – 'Common Activity Spaces Volume 2 Corridors'[28] and 'Volume 3 Lifts and Stairways'[29].

6.72 In areas where computer terminals are to be used, the lighting should be designed to avoid bright reflections on the screen and to ensure that the contents of the screen are legible. Further guidance can be found in the CIBSE Lighting Guide LG3[30].

General purpose socket-outlets and power connections

6.73 Sufficient 13 amp switched, shuttered socket-outlets, connected to ring or spur circuits should be provided to allow all portable appliances likely to be used simultaneously to be individually supplied. Activity Data Sheets indicate specific locations for the outlets associated with individual activities; the installation of twin outlets should be considered where the activities are in juxtaposition.

6.74 Domestic cleaning appliances with flexible leads nine metres long should be assumed and switched, single socket-outlets, usually in corridors, should be provided to enable such machines to operate over the whole area of the department with the exception of the post-mortem room and body stores. In the latter areas, special electrical safety precautions are necessary (see paragraph 6.80).

6.75 Fixed appliances rated up to 13 amps should be permanently connected to double pole switched spur boxes and fused as required. Appliances rated in excess of this load, or those requiring a three-phase supply, should be permanently connected to separate final circuits from fuse-boards and independently switched.

6.76 Local switches or other means of electrical isolation should be provided adjacent to plant and equipment to ensure the safety of operators and maintenance staff.

6.77 Heating appliances and automatically operated equipment should be provided with indicator lights to show when the equipment is energised. Such indicators should be incorporated either in the control panel of the

apparatus, in the control switch, or in the outlet from which the apparatus derives its supply.

6.78 The electrical supply connections to electro-medical equipment should comply with BS5724[31].

Socket-outlets in the post-mortem suite

6.79 The socket-outlets in the post-mortem room, body store, dirty utility and mortuary cleaning room should comply with BS196[32] and be splash-proof (as classified in BS5490)[25]. These socket-outlets should be fed via a safe supply unit. This unit should be mounted outside the post-mortem suite but be readily accessible to the post-mortem staff to permit the frequent trip testing that is required.

6.80 Guidance concerning the provision of the safe supply unit and the associated double-pole fused plugs and splash-proof socket-outlets is given in HN(82)39 'Electrical Safety in Post-Mortem Rooms'[33]. It should be noted that the term "hose-proof" used in HN(82)39 is now obsolete and that "splash-proof" (IPX4) is the current classification in BS5490[25].

6.81 Electro-mechanical floor cleaning equipment (scrubbers, water cleaning/vacuum units, etc) used during the special cleaning routines of the post-mortem room and body store should be dedicated to the zones supplied from the safe supply unit and be connected with double-pole fused plugs complying with BS196[32]. It is recognised that this will probably lead to some duplication of equipment, but this is necessary if the difficulty of matching plugs to sockets is to be avoided. It is not permissible, on an every-day basis, to operate this portable equipment fitted with standard 13 amp plugs described in BS1363[34] from socket-outlets outside the safe supply unit zone.

6.82 If x-ray facilities are required in the post-mortem room, this can best be achieved by the use of a dedicated portable machine. This will overcome the difficulties of socket and plug compatibility. However, the manufacturer of the safe supply unit should be asked to confirm that their unit can supply the particular x-ray machine's load characteristics.

Emergency electrical supplies

6.83 Guidance concerning the provision of emergency electricity supplies is given in HTM 11[35], and the grade of standby lighting provision is shown on the Activity Data A-Sheets. Safety lighting in accordance with HTM 11[35] and BS5266[36] should be provided on primary escape routes.

6.84 The refrigeration plant associated with the body store should be connected to the essential supply circuits.

Staff location system

6.85 Where accommodation is provided on a hospital site, it may be appropriate to extend the staff location system employed in the hospital to give cover to this department. Guidance on these systems is given in HTM 20[37].

Dictation system

6.86 A dictation system should be provided in the post-mortem room consisting of microphones and approved splash-proof foot controls, complete with plugs and splash-proof sockets. A remote controlled recorder unit should be located outside the post-mortem room.

Entrance bells

6.87 Each entrance to the mortuary should be provided with a bell push which should energise a sounder within the attendant's office. Visual indication of which entrance bell is being operated should be via a suitably labelled small indicator panel located in the attendant's office.

Telephones

6.88 Central telephone facilities, for internal and external calls, will normally be available and should be extended to serve this department in accordance with requirements described in paragraph 3.54.a, and as shown on the Activity Data Sheets. Telephones will normally be of desk pattern.

6.89 Guidance concerning the provision of telephone systems and equipment, including the telephone internal cabling distribution and telephone hand sets, is given in Health Building Note 48 – 'Telephone services'[38].

6.90 It is considered that there is no justification for providing any separate internal intercommunication systems in this accommodation in addition to the automatic telephone facilities.

Electric clocks

6.91 Clocks should operate in conjunction with a master clock system. If such a system is not available synchronous

clocks should be installed using a common clock circuit suitable for future connection to a master system. The location and types of clocks are indicated on the Activity Data A-Sheets. In circulation areas, clocks should be installed only where they can be viewed by numbers of staff/students/visitors.

Lightning protection

6.92 Protection against lightning should be provided in accordance with HTM 7[20], Engineering Data Sheet DB2[39] and BS6551[40].

INTERNAL DRAINAGE

6.93 The primary objective is to provide an internal drainage system that uses the minimum of pipework and remains water and air-tight at joints and connections, but is sufficiently ventilated to retain the integrity of water seals.

Design parameters

6.94 General design guidance is given in the relevant British Standards and Codes of Practice, including BS5572[41], and the current Building Regulations[2]. Recommendations regarding spatial and access requirements for public health engineering services are given in HSE Data Sheet EA5[42].

6.95 The gradient of branch drains should be uniform and adequate to convey the maximum discharge to the stack without blockage. Practical considerations such as available angles of bends/junctions and their assembly, as well as space considerations, usually limit the minimum gradient to about 1:50 (20mm/m). For larger pipes, eg 100mm diameter, flatter gradients can be used but require workmanship of a high standard if adequate self-cleansing flow is to be maintained. It is not envisaged that pipes larger than 100mm diameter will be required within this department.

Operational considerations

6.96 Unusual and difficult maintenance problems can arise because of user interference and abuse. For example, the disposal of paper towels into WCs after hand-washing or after their misuse for some other purpose is a frequent cause of blockage, particularly in long branches laid to flat gradients. Adequate provision of disposal receptacles or, where appropriate, the installation of warm-air dryers can help to mitigate this problem.

Materials specification

6.97 Waste pipework should, as far as practicable, be concealed; where exposed, it should be metallic and very securely fixed. Although adequate for drainage requirements, UPVC may not always be acceptable to the fire officer and neither should it be installed above "sensitive" areas, eg electrical switchrooms.

6.98 Drains and gullies in the post-mortem suite must be capable of being easily cleaned and maintained. In order that they do not cause tripping hazards, all drains and gulleys must be flush-fitting with the floor finishes. They must also be constructed from materials resistant to the effects of disinfectants, hot water and other chemical reactants likely to be present in a mortuary.

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7.0 Cost information

Introduction

7.1 For all types of health buildings it is important that building costs and revenue expenditure be kept as low as possible consistent with acceptable standards. Within this general context, Building Notes provide guidance on accommodation for health buildings which the Department, in conjunction with the National Health Service, recommends for the provision of a given service.

7.2 Most hospitals require a mortuary, ie a body store and a bier room, but with the fall in the number of non-coroner's post mortems, post-mortem facilities would usually be centralised at one site within a district. Health authorities are advised to consider at an early stage the economic advantages of shared NHS/local authority facilities (see paragraphs 2.10-2.14), giving consideration also to the travelling distances for bodies, bereaved relatives, visiting clinicians, pathologists, police, and undertakers.

7.3 The minimum recommendation for autopsy space is for a room containing two tables. Paragraphs 2.32 and 2.33 consider the number of post-mortems per table. Project teams must satisfy themselves that there is a sufficient need and give careful consideration to the potential workload in order to avoid producing proposals for larger facilities than are necessary.

Functions

7.4 It is recognised that not all project teams will require to provide all facilities, and even those who do may wish to vary the size of one or more of the functions to suit local circumstances. For this reason, the various functions have been separated to allow maximum flexibility to project teams in their choice of provision.

7.5 The functional units for this Note are:

- Body viewing facilities
- Body store - three sizes: 6 Stores (2 compartments)
  12 stores (4 compartments)
  18 stores (6 compartments)
- Deep freeze - three stores (1 compartment)
- Post-mortem suite - containing 2 autopsy tables

Each of the functions is described below and schedules of areas for each function are provided at the end of this Chapter.

Optional Accommodation and Services

7.6 This Note, where appropriate, draws attention to alternative ways of providing services or facilities, including the likely cost implications. The information will enable project teams to select the solution most suitable to their needs. Optional Accommodation and Services (OAS) costed in this Note is described below and listed in the schedules at the end of this Chapter.

Relatives' facilities

7.7 These facilities have been costed on the basis of a single size only, it being considered that the unit appropriate for the smaller size of body store is equally adequate for the very largest.

Body store

7.8 Three sizes of unit have been costed to allow the project team to choose according to their particular circumstances. (Calculation of need is dealt with in paragraphs 2.25-2.28.)

Deep freeze

7.9 This comprises one compartment containing three stores. In cases where particular needs make additional stores necessary, compartments should be added as appropriate.

Post-mortem suite

7.10 One size of unit, containing two tables, has been costed as it is unlikely that more than two tables will be required for NHS purposes.

Post-mortem table

7.11 An optional allowance for an additional table has been included for the occasions when larger facilities become necessary. The additional table will be accommodated within the post-mortem room; separate accommodation is not provided. (See paragraph 2.15.)

Technician's office/Rest room

7.12 This accommodation will be required wherever there are post-mortem facilities, but may not be necessary where only a small body store is provided.

Works costs

7.13 To prepare an estimate of the works cost for a scheme, reference should be made to the Capricode Health Building Procedures manual (Chapter 1, Stage 1, Annexe 1.c). The total departmental cost for a scheme is derived by aggregating the cost of the functional units and OAS as appropriate to the particular scheme.

7.14 The cost allowance covers the building and engineering guidance set out in this Note. The costing of the functional units assumes that the mortuary and post-mortem facilities will be provided in a separate building within the curtilage of a hospital site.

Circulation

7.15 Space for circulation, which includes allowances for planning provision, engineering zone and partitions, has been added to each functional unit and is included in the cost allowances and areas of OAS.

Communications

7.16 Although it is expected that this department will form a complete building, separated from other buildings on the site, the same rules for the calculation of cost allowances have been applied as for other hospital departments. Staircases, lifts and plant rooms, with the exception of the combined electrical switchroom, and refrigeration plant room (which will usually house the electrical switchgear), are not included in the cost allowances.

Dimensions and areas

7.17 In determining spatial requirements, the essential factor is not the total area provided but the critical dimensions, ie. those dimensions critical to the efficient functioning of the activities which are to be carried out. There are therefore no recommended areas associated with the schedules of activity spaces. To assist project teams in preparing detailed design solutions for the rooms and spaces, the Department has carried out studies to establish critical dimensional requirements. The results of these studies appear as ergonomic diagrams at the end of this Note and in Health Building Note 40 – 'Common Activity Spaces'.

7.18 For development planning, and at the earliest stage of a design, it may be convenient for designers to have data available which enables them to make an approximate assessment of the sizes involved. For this reason, the schedules of areas, prepared for the purpose of establishing the cost allowances, are included at the end of this Chapter.

7.19 It is emphasised that the areas published **do not** represent recommended room sizes, maximum or minimum allowances, nor are they to be regarded in any way as specific individual entitlements.

Engineering spaces

7.20 Space for a heating and ventilating zone adjacent to the external walls and for small vertical ducts is included, together with the planning provision, as part of the circulation.

Engineering services

7.21 The following engineering services, as described in Chapter 6, and exemplified in the Activity Data, are included in the cost allowances. Primary engineering services are assumed to be conveniently available at the boundary of the department.

a. **Mechanical services**
   Heating: Low pressure hot water system, maximum surface temperature 82°C.

   Ventilation: Mechanical supply and extract for the post-mortem suite and mechanical extract for the specimen store to meet clinical and functional requirements; other areas will be mainly naturally ventilated.

   Cold water service: Centrally supplied to service points including drinking water and fire hose reels with a segregated supply to the post-mortem suite. Storage tanks excluded.

Hot water service: Centrally supplied at 60°C with a segregated supply to the post-mortem suite. Storage excluded.

b. **Electrical services**
Departmental distribution switchboard.

General lighting as required by tasks.

Fluorescent, tungsten, safe light and emergency luminaires as appropriate. Dimming included for viewing and bier rooms.

Socket-outlets and other power outlets for fixed and portable equipment. Safe supply system for socket-outlets in post-mortem suite included.

Supplementary equipotential earth bonding connections.

Standby and safety installation from the main hospital supplies.

Dictation system for post-mortem room.

Bell push system for all departmental entrances.

Fire alarm system.

Impulse clocks.

Staff location extension to the hospital system.

Telephone internal distribution cabling and outlets. (Hand-sets excluded.)

c. **Equipment (Group 1)**
Body storage chambers and associated refrigeration plant. Disposal macerator.

Schedules of accommodation

Body store

Para no.	Activity Space	Space area sq.m.	6 Stores Qty.	6 Stores Total area sq.m.	12 Stores Qty.	12 Stores Total area sq.m.	18 Stores Qty.	18 Stores Total area sq.m.
4.11–4.16	Body store area	12.50	1.0	12.50				
		20.00			1.0	20.00		
		27.50					1.0	27.50
4.12	Refrigerated stores	7.00	1.0	7.00				
		12.00			1.0	12.00		
		17.00					1.0	17.00
4.16	Trolley bay	2.50	1.0	2.50	2.0	5.00	2.0	5.00
4.38	General store	3.00	1.0	3.00				
		5.00			1.0	5.00	1.0	5.00
4.36	Disposal area	2.00	1.0	2.00				
		4.00			1.0	4.00	1.0	4.00
4.37	Cleaner's room	6.50	1.0	6.50	1.0	6.50	1.0	6.50
6.57	Refrigeration plant	7.50	1.0	7.50				
		10.00			1.0	10.00	1.0	10.00
	Nett totals			41.00		62.50		75.00
	Circulation etc			11.50		18.00		21.50
	Totals			**52.50**		**80.50**		**96.50**
	Departmental areas			55 sq.m.		80 sq.m.		95 sq.m.

Para no.	Activity Space	Space area sq.m.	Qty.	Total area sq.m.
Body viewing facilities				
4.6	Waiting room	11.00	1.0	11.00
4.6	WC/Washroom	6.00	1.0	6.00
4.7	Viewing room	8.00	1.0	8.00
4.8	Bier room	10.00	1.0	10.00
	Nett total			35.00
	Circulation etc			8.50
	Total			**43.50**
	Departmental area			45 sq.m.
Deep freeze store				
4.11	Body store area	3.50	1.0	3.50
4.12	Freezer compartment	2.00	1.0	2.00
	Nett total			5.50
	Circulation etc			1.50
	Total			**7.00**
	Departmental area			7.0 sq.m.
Post mortem suite				
4.17	Post mortem room	60.00	1.0	60.00
4.23	Dirty utility/Instrument store	11.00	1.0	11.00
4.28	Transit area/Staff changing	30.00	1.0	30.00
4.30	Observation area	8.00	1.0	8.00
4.32	Specimen store	5.00	1.0	5.00
4.33	Pathologist's Office	11.00	1.0	11.00
4.26	Cleaner's room	6.50	1.0	6.50
	Nett total			131.50
	Circulation etc			24.00
	Total			**155.50**
	Departmental area			155 sq.m.
Technician's office				
4.34	Technician's office	13.00	1.0	13.00
	Nett total			13.00
	Circulation etc			3.50
	Total			**16.50**
	Departmental area			16.5 sq.m.

Optional accommodation and services

Para no	Activity Space	Space area sq.m.	Circn etc. sq.m.	Total area sq.m.
7.11	Post Mortem Table	15.00	4.00	19.00

8.0 Activity Data

Introduction

8.1 "Activity Data" is an information system developed to help project and design teams by defining the users' needs more precisely. This information constitutes the computerised Activity Data Base, first issued to Health Authorities in England and to the Health Departments in Scotland, Northern Ireland and Wales in 1989, and subsequently up-dated twice yearly. It comprises three types of information sheet: Activity Space Data Sheets (A-Sheets), their supporting Activity Unit Data Sheets (B-Sheets), and A-Sheet Component listings, (known as D-Sheets).

8.2 A-Sheets record in more detail than is described in this Note each task or activity that is performed in a particular activity space (which may be a room, space, corridor or bay), together with environmental conditions and the technical data necessary to enable the activities to be performed. Each A-Sheet also contains a list of the titles and code numbers of the relevant B-Sheets.

8.3 B-Sheets provide narrative text and graphics to scale relating to one activity. They show equipment fitted or supplied as part of the building, and the necessary engineering terminals. There are also "component B-Sheets", which show a range of particular components rather than an activity.

8.4 D-Sheets provide information about the total quantities of components extracted from all the B-Sheets selected for inclusion in an individual A-Sheet.

8.5 Activity Data is only available in the form of magnetic media, but this may be used to generate paper copies where required.

8.6 Further information about the use and preparation of Activity Data can be found in the 'Guide to 'A' and 'B' Activity Data Sheets and their use in Health Building Schemes', issued to Health Authorities with EL(89) MB/19 (in Wales, WHC(89)18). Health Authorities may obtain additional copies of the Guide, and an explanatory video tape from NHS Estates, Room 540, Euston Tower, 286 Euston Road, London NW1 3DN.

Activity Data applicable to this Note

8.7 The A-Sheets recommended for the activity spaces described in this Note are either new sheets, amended ones, or selected from existing sheets. A-Sheet code numbers are given at the end of this Chapter.

8.8 Further Activity Data sheets may be selected, or drawn up by project teams to their own requirements, for any services not described in this Note or included in the list. Members of project teams are advised to contact their Regional Activity Data Co-ordinator/Welsh Office for information and advice about the selection of Activity Data at an early planning stage.

8.9 In order to ensure consistent and economic provision, variations from the A-Sheets recommended for the spaces covered in this Note should be considered only where it has been decided that the function of a space will substantially differ from that described.

Note: The Activity Data A-Sheets may not carry a title identical to the activity spaces detailed in this Note. Use of the appropriate A-Sheet code number will, however, result in the correct activity space being accessed.

Activity Space	A-Sheet Code no.	Para no. in HBN
Body store area		
1. Body store area	L1611	4.11-4.16
2. General store	W0701	4.38
3. Disposal area	Y0604	4.36
4. Cleaner's room	Y1204	4.37
Body viewing facilities		
5. Waiting room	J1304	4.6
6. WC/Washroom	V0905	4.6
7. Viewing room	L1610	4.7
8. Bier room	L1609	4.8
Deep freeze store		
9. Body store area	L1611	4.11
10. Freezer compartment	L1613	4.12
Post-mortem suite		
11. Post-mortem room	L1601	4.17
12. Dirty utility/Instrument store	L1607	4.23
13. Transit area/staff changing	G0505	4.28
14. Observation area	L1602	4.30
15. Specimen store	W0702	4.32
16. Pathologist's office	M1201	4.33
17. Cleaner's room	Y1204	4.26
Technician's office		
18. Technician's office	M1801	4.34

Appendix 1

Critical dimensions

Introduction

1. Critical dimensions are those dimensions which are critical to the efficient functioning of an activity; thus the size of components, their position and the space around them may all be critical to the task being performed. Guidance on these dimensions for a particular activity is provided in the form of **component-user data sheets**. These illustrate components, ie equipment, furniture and fittings, and provide ergonomic data on the space required for users to move, operate or otherwise use the component; information about the component, eg fixing heights, and the users, eg reach, is also provided. Component-user data sheets thus complement the information given on Activity Data B-Sheets (see Chapter 8).

2. This Appendix contains sheets relevant to this Note. In addition, ergonomic data common to the design of a number of departments is contained in the Health Building Note 40 – 'Common Activity Spaces', to which reference should also be made.

Component dimensions

3. These relate to the size and position of components as follows:

a. sizes of components are shown thus

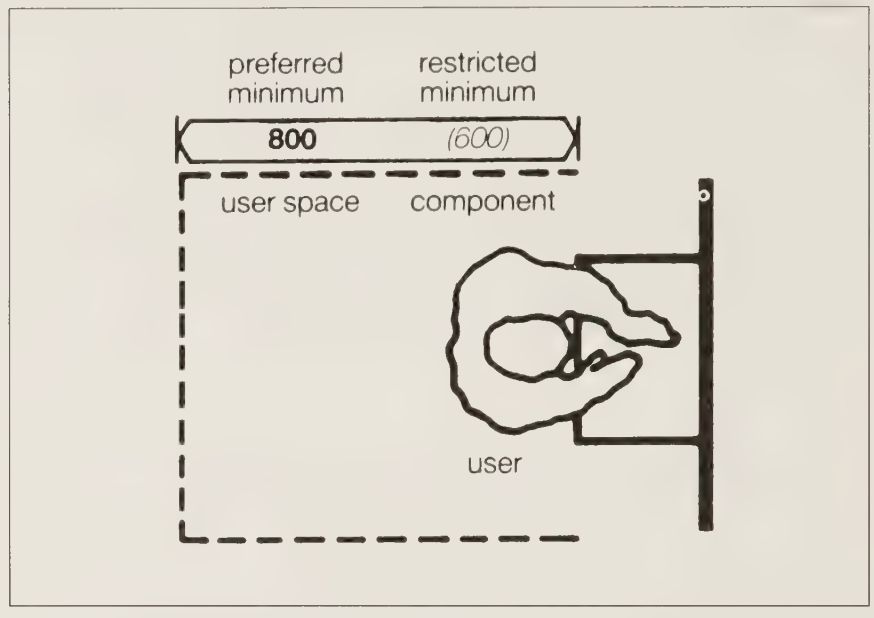
b. preferred component fixing heights are shown as height above floor level thus

1000
1000-1300

(In some cases an acceptable range of fixing heights is also given in italics.)

Activity dimensions

4. Activity dimensions define the user space, which is the minimum space required to perform an activity. Two types of activity dimensions are given:

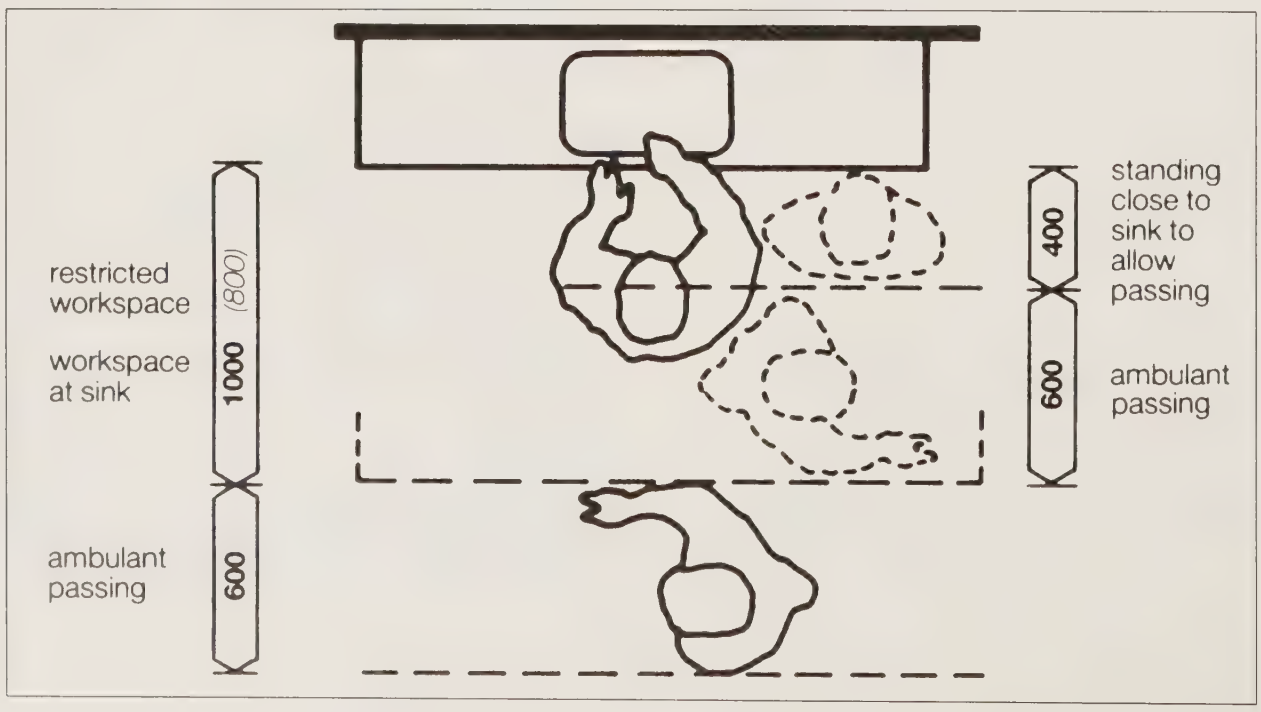


a. preferred minimum - this defines the minimum space required to carry out an activity efficiently and is shown in bold type.

b. restricted minimum - this will only allow the activity to be performed at the expense of the user experiencing some difficulty. It is not recommended for general application but may be appropriate when considering the overlapping that can be allowed when two user spaces are adjoining.

Selection of activity dimensions

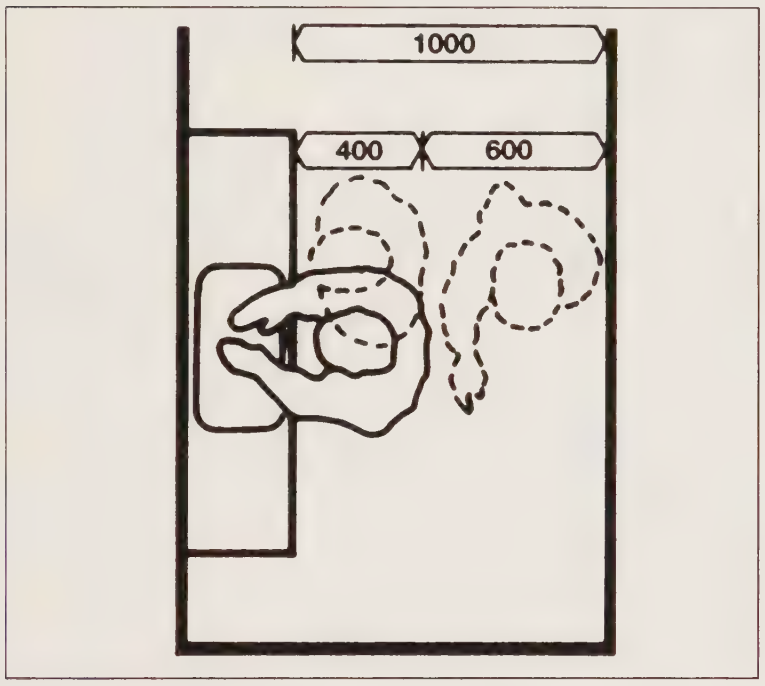
5. When using component-user data sheets to design activity space layouts, selection of the appropriate activity dimensions is essential for economy and efficiency. Selection should be based on careful consideration of the frequency, duration, timing and importance of the activities and also the number of people involved. A typical example of the use of a sink showing activity dimensions provided by the component user data sheet is shown below.



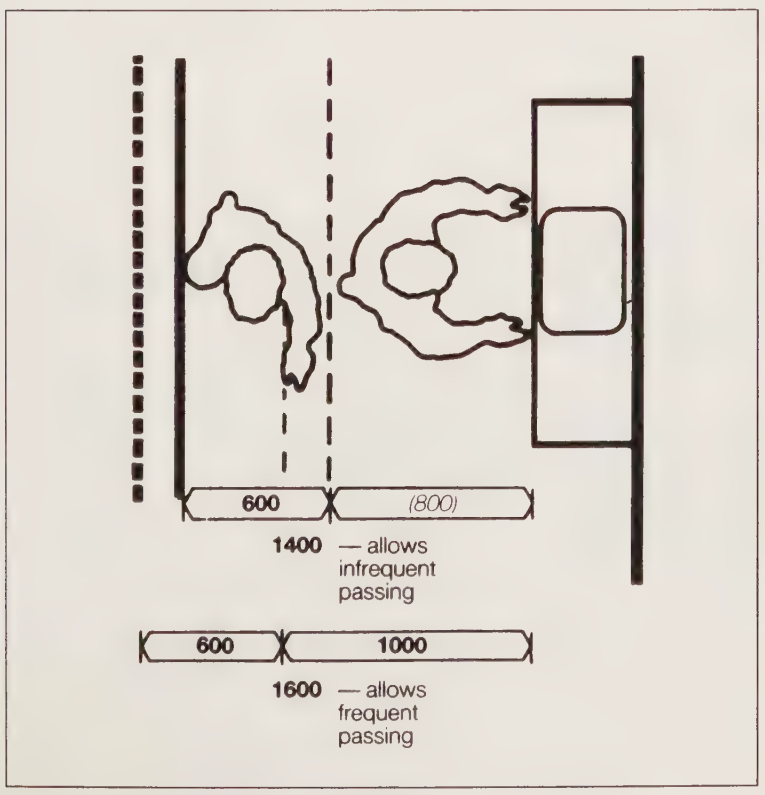
Examples

6. The following worked examples show the sink being used in three different situations and show how the appropriate dimensions would be selected but do not necessarily relate to this particular building guidance. These examples have been simplified and additional factors such as the movement of mobile equipment may also be critical.

a. if the room is normally occupied by one person only the 1,000 workspace dimension may be applicable. An (800) restricted dimension should not be used as this dimension is only applicable where two user spaces are adjoining, not where an individual user space is bounded by a wall or solid obstruction. If the person using the sink stops work and stands close to the sink, 1,000 is also sufficient space to allow a second person to pass, ie 600 + 400.

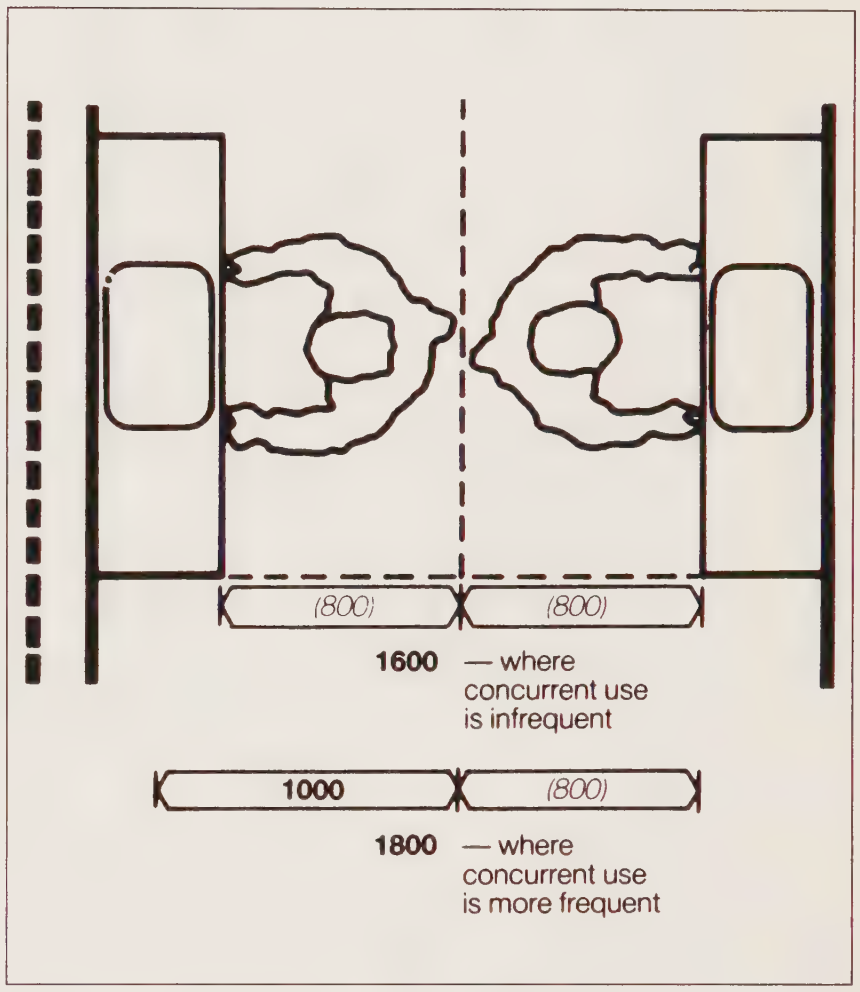


b. if space is required to allow a person to pass, without the user of the sink stopping work, then the 600 passing dimension is added to the workspace dimension. If passing is infrequent then temporary restriction of the sink user's space may be acceptable; this gives an overall dimension of 600 + (800) = 1,400. If passing is frequent and restriction of the sink user's space is not acceptable the overall dimension is 600 + 1,000 = 1,600



c. where space has to be provided to enable two sinks to be used concurrently the overall dimension between sinks will be the sum of the workspace dimensions, eg if concurrent use is infrequent and of short duration then (800) + (800) = 1,600 may be acceptable. Alternatively 1,000 + (800) = 1,800 allows the full workspace for one sink user and restricted space for the second user, where concurrent use of the sinks is more frequent.

Note. The passing of a third person between the two sink users may also be critical in this example. Where the sinks are staggered 1,400 may be acceptable as in example (b).



List of ergonomic drawings

1.	Autopsy tables	:	2 table layout
2.	Mortuary trolley	:	straight movement: without side attendants
3.	Mortuary trolley	:	straight movement: attendant on one side
4.	Mortuary trolley	:	turning through 180°
5.	Mortuary lifting trolley		
6.	Mortuary trolley	:	moving through 1500 door set
7.	Mortuary trolley	:	parking at 90° to wall
8.	Mortuary trolley	:	parking parallel to wall
9.	Body store	:	individual chambers
10.	Body transfer	:	from patient trolley to mortuary trolley

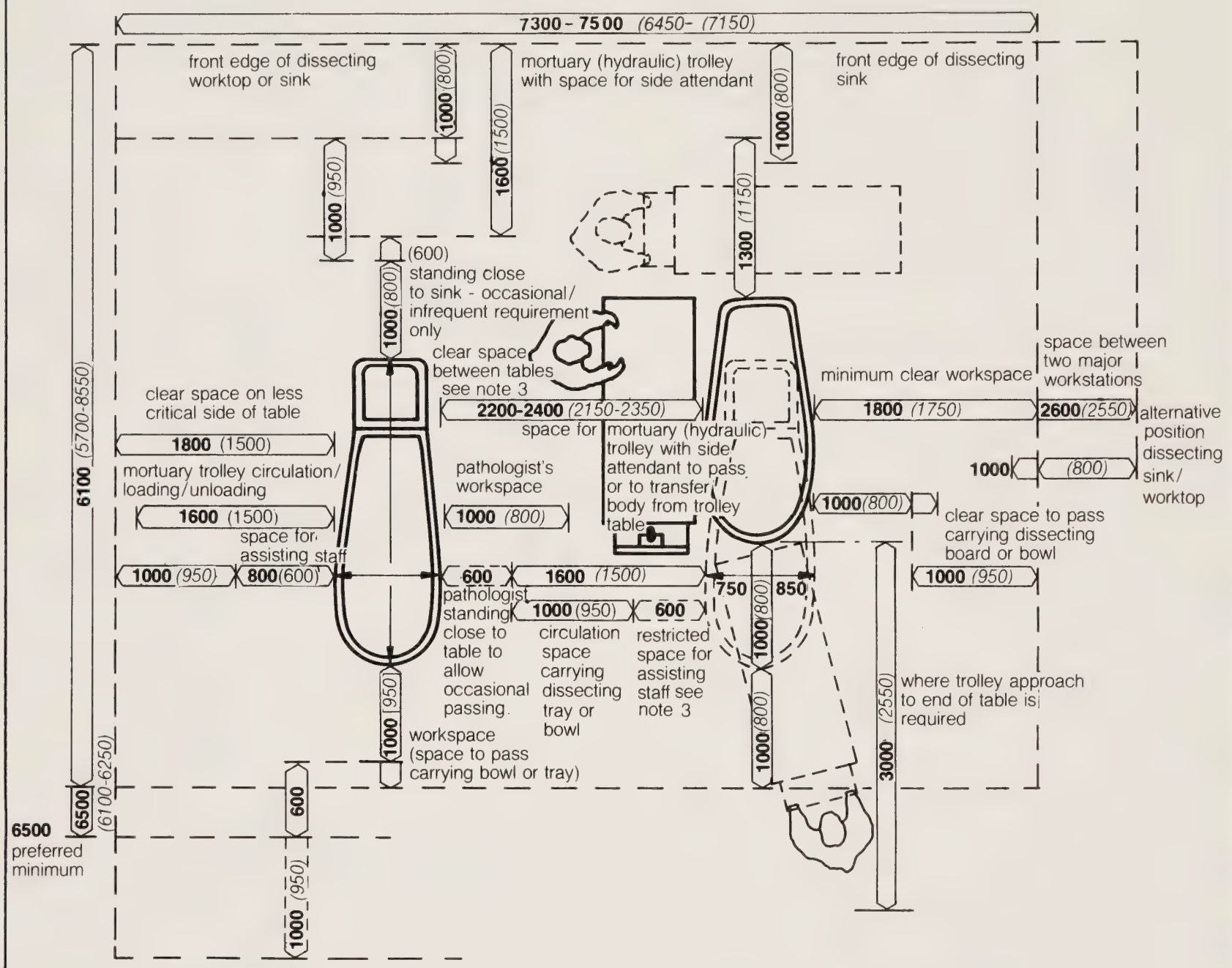
Activities:
Concurrent activities/examinations on two adjacent mortuary tables

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Autopsy Tables

2 Table Layout

Users:
Mortuary technicians and pathologists


7300 - 7500 (6450- (7150)
front edge of dissecting worktop or sink
mortuary (hydraulic) trolley with space for side attendant
front edge of dissecting sink
1000 (800)
1600 (1500)
1000 (950)
1300 (1150)
(600)
standing close to sink - occasional/ infrequent requirement only
clear space between tables see note 3
space between two major workstations
minimum clear workspace
clear space on less critical side of table
2200-2400 (2150-2350)
space for mortuary (hydraulic) trolley with side attendant to pass or to transfer body from trolley table
1800 (1750)
2600 (2550)
alternative position dissecting sink/ worktop
1800 (1500)
mortuary trolley circulation/ loading/unloading
pathologist's workspace
1000 (800)
clear space to pass carrying dissecting board or bowl
1600 (1500)
space for assisting staff
1000 (950)
800 (600)
600
pathologist standing close to table to allow occasional passing.
circulation space carrying dissecting tray or bowl
restricted space for assisting staff see note 3
750
850
where trolley approach to end of table is required
workspace (space to pass carrying bowl or tray)
6100 (5700-8550)
6500 (6100-6250)
3000 (2550)
6500 preferred minimum

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. An absolute minimum of 2 tables is recommended for all departments.

2. Space must be allowed for turning and loading of a mortuary (hydraulic) trolley.

3. It is infrequent that persons will be working on both sides of the table. However, circulation space and passing space must be allowed to accommodate all likely activities and movements including reduced workspaces and temporary workplaces.

4. Porcelain tables are generally preferred by users because they are less noisy in use, are easier to clean and less vulnerable to abrasion. Some stainless steel tables provide foot operated mechanism to hold body in tilt position. This assists the drainage of body fluids (max. tilt approx. 45°).

5. Where tables are not slightly staggered (eg as shown dotted), then this dimension must be increased to **800** and overall distance between tables to **2400** *(2350)*.

6. PLANNING: The positioning of DISECTING BENCHES and SINKS in relation to associated AUTOPSY TABLES should preferably avoid the need to cross circulation when moving between tables.

1

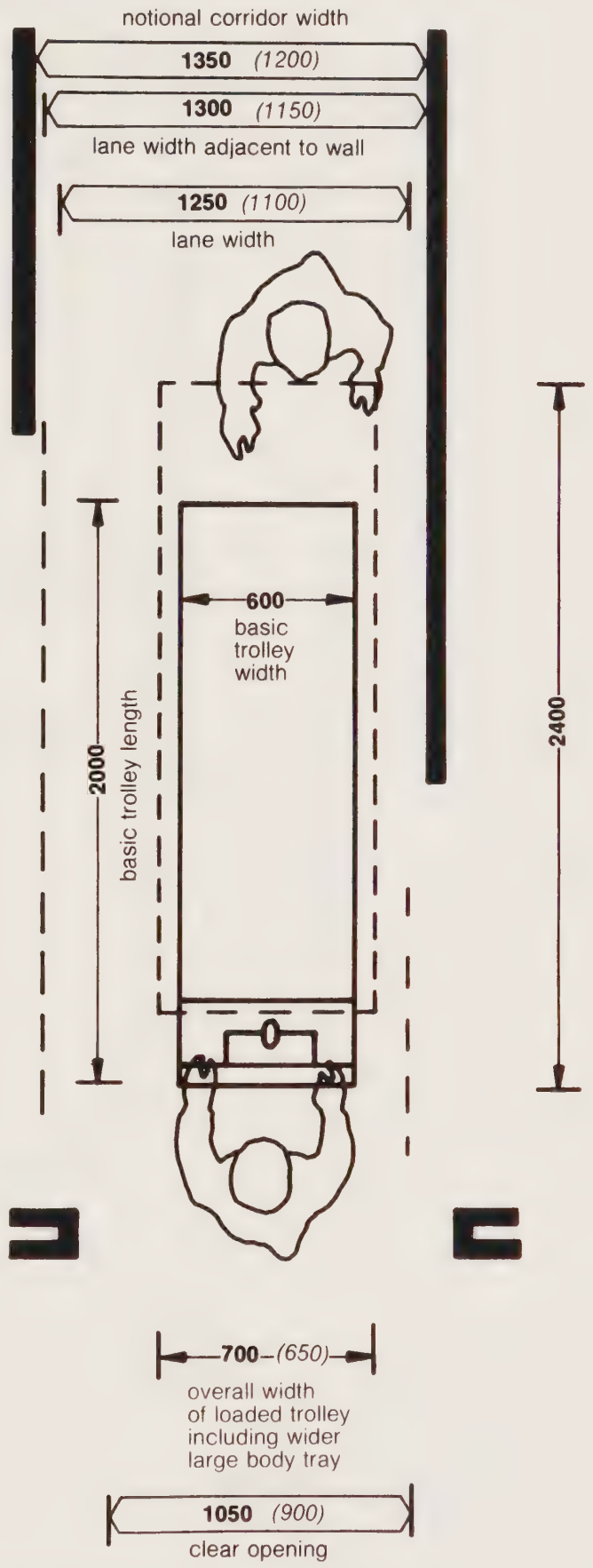
Activities:
Straight movement of mortuary trolley without side attendants (1 or 2 staff see note 2 below)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Mortuary Trolley

Hydraulic or Mechanical Lifting

Users:
Mortuary staff and Funeral Directors



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. This is a very heavy trolley, therefore, failure to provide adequate operational clearances will result in severe and excessive damage to both equipment and building fabric.

2. Trolley castor characteristics can vary or are variable. For one man operation two fixed (front) and two swivelling (rear) castors are necessary for satisfactory directional control. Trolleys with four freely swivelling castors generally require two man operation to maintain a safe line of travel.

3. IMPORTANT: Where BED access is required to mortuary areas, the space required for circulation must be at least 250 mm wider than the dimensions given above (see BED component/user data sheets).

4. Overall width of 700 includes allowance for buffers.

2

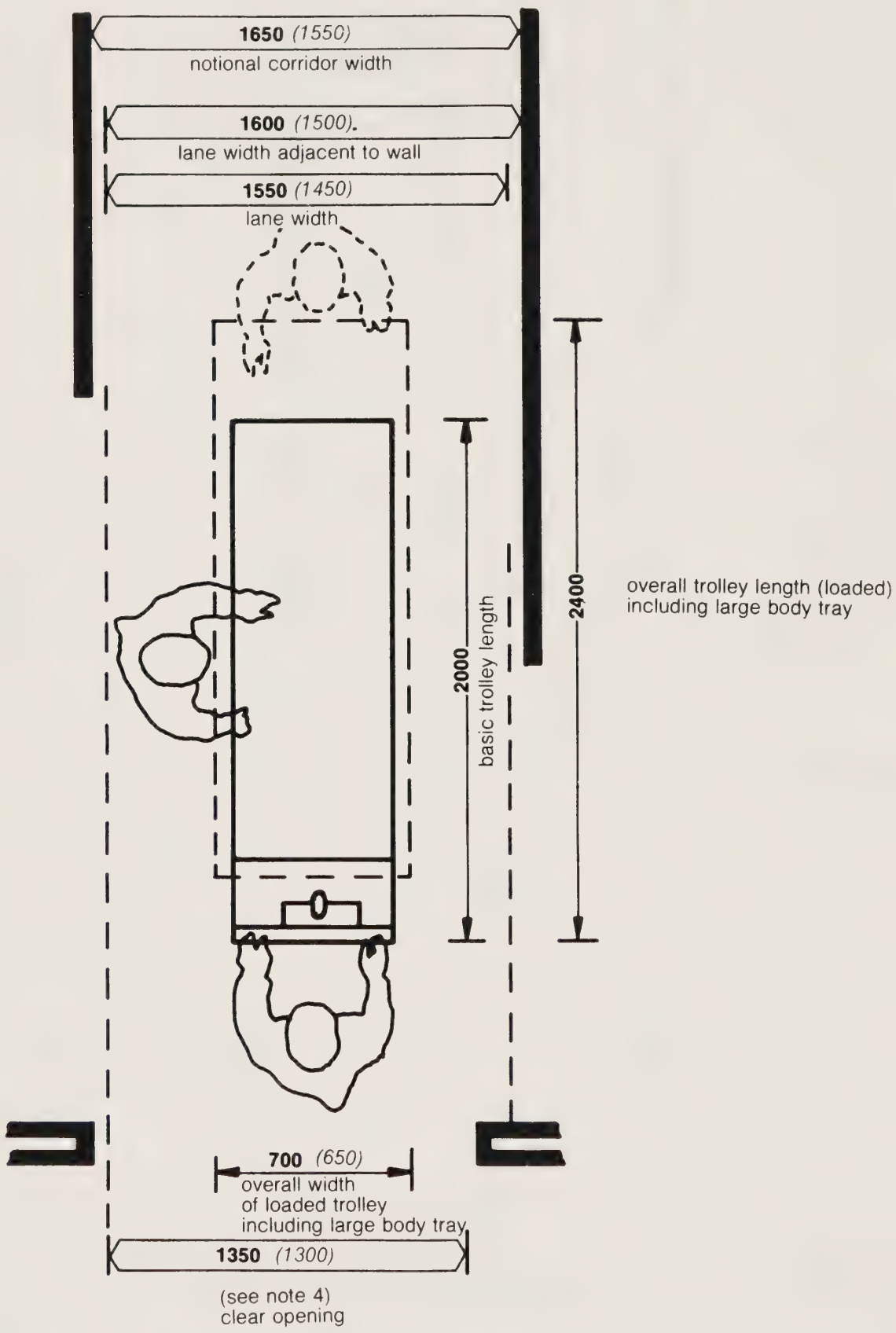
Activities:
Straight movement of mortuary trolley with basic workspace/attendant space on one side. (2, 3 or more staff - see note 2 below)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Mortuary Trolley

Hydraulic or Mechanical Lifting

Users:
Mortuary staff and Funeral Directors



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. This is a very heavy trolley, therefore, failure to provide adequate operational clearances will result in severe and excessive damage to both equipment and building fabric.

2. Trolley castor characterists can vary or are variable. For one man operation two fixed (front) and two swivelling (rear) castors are necessary for satisfactory directional control. Trolleys with four freely swivelling castors generally require two man operation to maintain a safe line of travel.

3. The widths shown above will also permit BED access to mortuary areas; but without attendant space at side of bed (see also BED component data sheets).

4. Where it is not critical for attendants to maintain their position at the side of the trolley when passing through openings, then a clear opening of 1050 *(900)* is adequate. Where BED access (ie without side attendant) is required, however, the dimensions given above should be maintained.

3

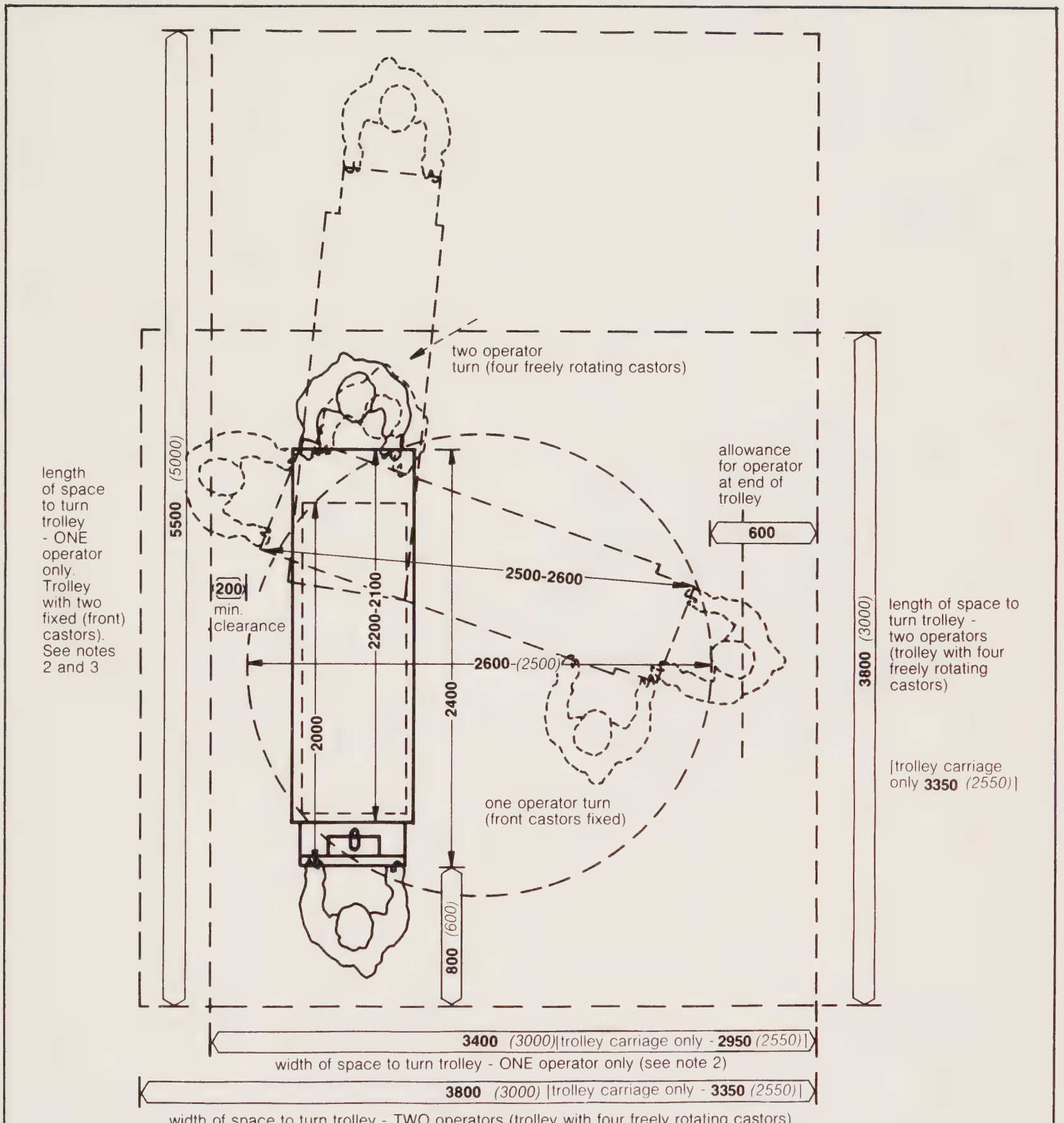
Activities:
Turning mortuary trolley through 180°, where trolley is manoeuvred by either 1 or 2 staff (see note 2)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Mortuary Trolley

Hydraulic or Mechanical Lifting

Users:
Mortuary staff and funeral directors.


two operator
turn (four freely rotating castors)
length of space to turn trolley - ONE operator only. Trolley with two fixed (front) castors). See notes 2 and 3
5500 (5000)
200 min. clearance
2200-2100
2500-2600
2600-(2500)
2000
2400
800 (600)
one operator turn
(front castors fixed)
allowance for operator at end of trolley
600
3800 (3000)
length of space to turn trolley - two operators (trolley with four freely rotating castors)
[trolley carriage only 3350 (2550)]
3400 (3000)[trolley carriage only - 2950 (2550)]
width of space to turn trolley - ONE operator only (see note 2)
3800 (3000) [trolley carriage only - 3350 (2550)]
width of space to turn trolley - TWO operators (trolley with four freely rotating castors)

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. This is a very heavy trolley, therefore, failure to provide adequate operational clearances will result in severe and excessive damage to both equipment and building fabric.

2. Trolley castor characterists can vary or are variable. For one man operation two fixed (front) and two swivelling (rear) castors are necessary for satisfactory directional control. Trolleys with four freely swivelling castors generally require two man operation to maintain a safe line of travel.

3. Where it is not critical for attendants to maintain their position at the side of the trolley when passing through openings, then a clear opening of **1050** *(900)* is adequate.

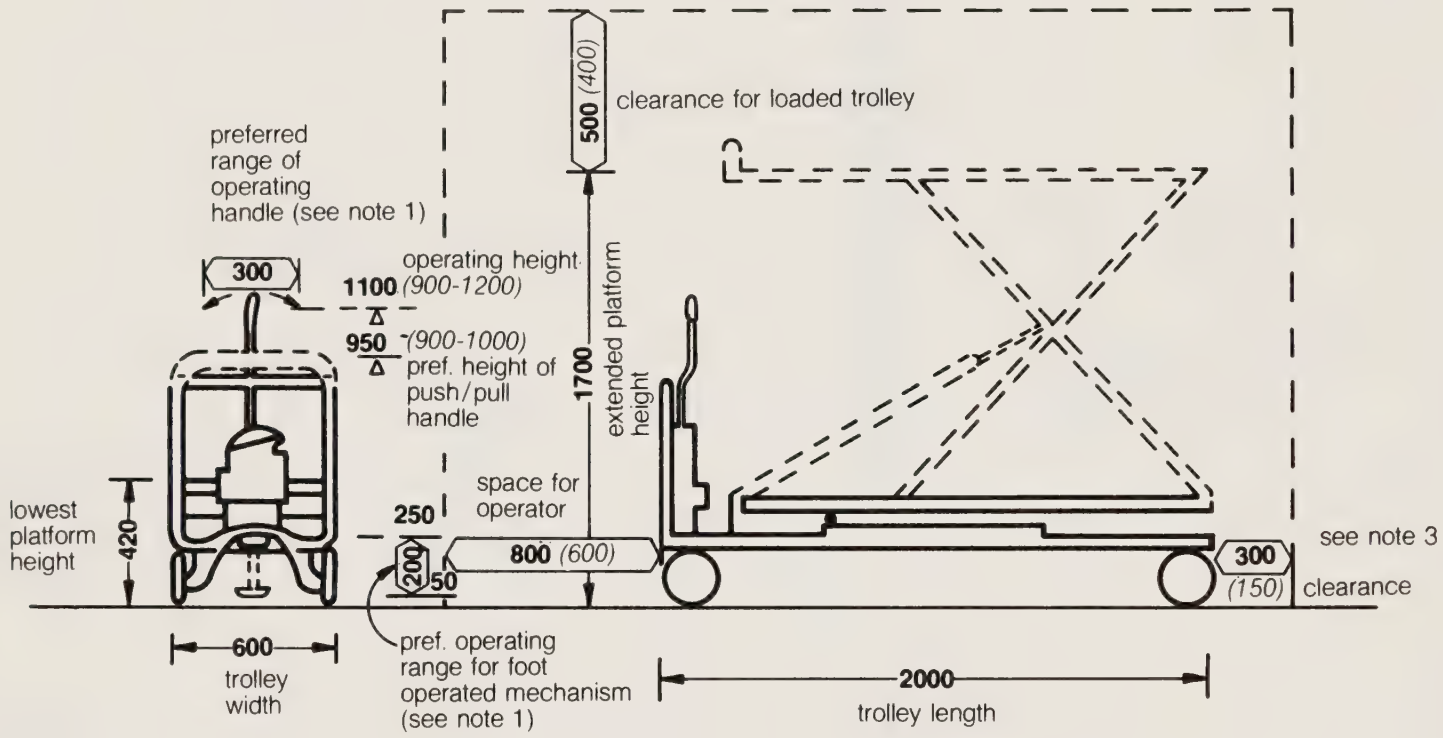
4

Activities:
Loading and unloading bodies into the body store on body trays. Movement of bodies around the Mortuary Department.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Mortuary Lifting Trolley

Users:
Mortuary staff and funeral directors



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Trolleys can be fitted with eight hydraulic or mechanical lifting mechanisms and are usually manually operated. Some battery operated electro-hydraulic models are also available and their use is generally recommended. Foot operated lifting mechnisms are ergonomically more satisfactory than hand operated models. Type of mechanism does not significantly affect the space required to operate or manoeuvre the trolley.

2. Planning involving these trolleys requires consideration of their use in both an extended and collapsed position. Smaller persons will have greater difficulty in using the trolley in its extended position whilst loaded, than taller persons. It is not recommended that the trolley be used frequently or constantly in its fully extended position. Therefore body trays should be stored, where possible, on lower rather than higher shelves in the body store.

3. This is a heavy trolley, and failure to provide adequate operational clearances will result in excessive damage to equipment and building fabric.

5

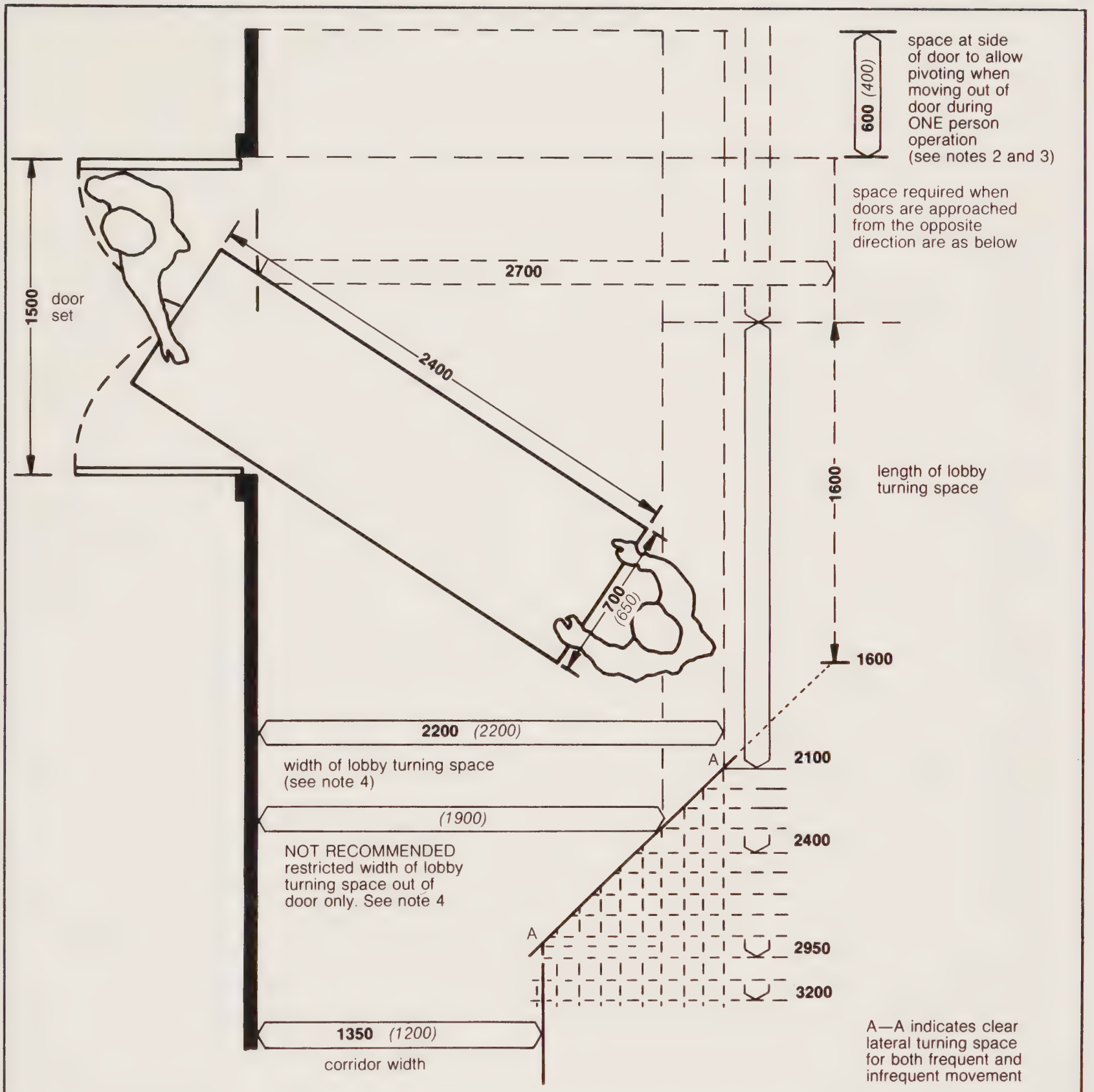
Activities:
Moving mortuary trolley through **1500** door set. 1 or 2 staff (see notes 2, 3 and 4)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Mortuary Trolley

Hydraulic or Mechanical Lifting

Users:
Mortuary staff and Funeral Directors


600 (400)
space at side of door to allow pivoting when moving out of door during ONE person operation (see notes 2 and 3)
space required when doors are approached from the opposite direction are as below
1500
door set
2700
2400
700 (650)
1600
length of lobby turning space
1600
2200 (2200)
width of lobby turning space (see note 4)
A
2100
(1900)
NOT RECOMMENDED restricted width of lobby turning space out of door only. See note 4
2400
A
2950
3200
1350 (1200)
corridor width
A—A indicates clear lateral turning space for both frequent and infrequent movement

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. This is a very heavy trolley, therefore, failure to provide adequate operational clearances will result in severe and excessive damage to both equipment anfd building fabric.

2. Trolley castor characteristics can vary or are variable. For one man operation, two fixed (front) and two swivelling (rear) castors are necessary for satifactory directional control. Trolleys with four freely swivelling castors generally require two man operation to maintain a safe line of travel.

3. The lobby depth dimensions of **2200** shown assumes that all trolleys can be moved by two persons and can have four freely rotating castors.

4. **2200** is also the minimum (ie. restricted) lobby width for movements where the trolley is pushed by ONE person only (ie. with 2 fixed (front) castors). This applies particularly to the action of turning into the door opening with one man operation, where a deep lobby is required for unimpeded movement.

5. Where BED access is required to mortuary areas, the lobby depth must be increased by at least 300mm (see also BED component data sheets).

6

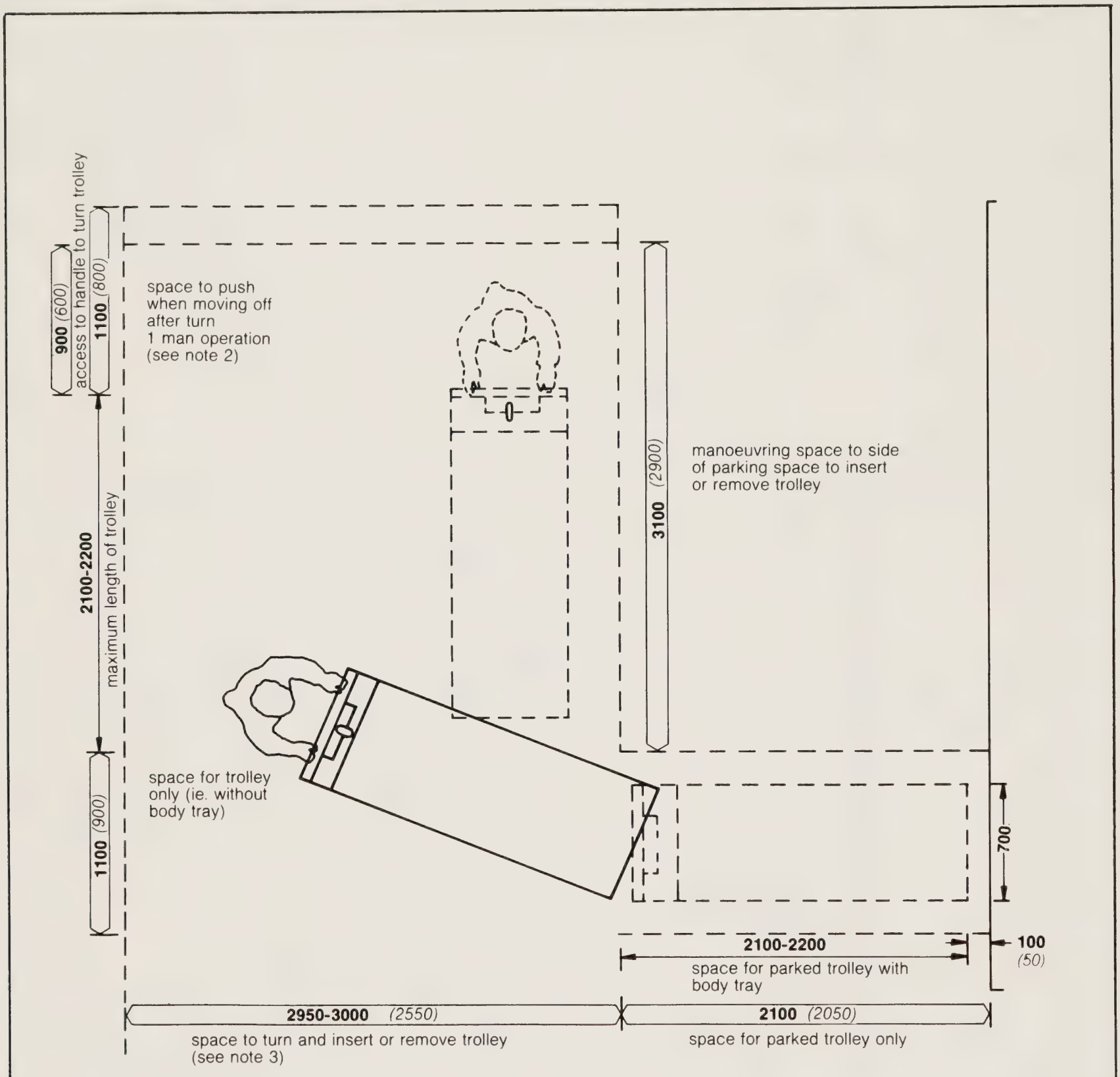
Activities:
Parking hydraulic lifting trolley (between obstructions) at 90° to wall (1 or 2 staff - see note 2, 3 and 4)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Mortuary Trolley

Hydraulic or Mechanical Lifting

Users:
Mortuary staff and Funeral Directors


900 (600)
access to handle to turn trolley
1100 (800)
space to push when moving off after turn 1 man operation (see note 2)
2100-2200
maximum length of trolley
3100 (2900)
manoeuvring space to side of parking space to insert or remove trolley
space for trolley only (ie. without body tray)
1100 (900)
700
100 (50)
2100-2200
space for parked trolley with body tray
2950-3000 (2550)
space to turn and insert or remove trolley (see note 3)
2100 (2050)
space for parked trolley only

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. This is a very heavy trolley, therefore, failure to provide adequate operational clearances will result in severe and excessive damage to both equipment and building fabric.

2. Trolley castor characterstics can vary or are variable. For one man operation, two fixed (front) and two swivelling (rear) castors are necessary for satisfactory directional control. Trolleys with four freely swivelling castors generally require two man operation to maintain a safe line of travel.

3. The preferred depth of approach space in front of parking space allows for some realignment of trollet before entry into parked position. This is generally not possible when the approach space is restricted, and consequently the restricted approach space dimension should not be used where available parking space is also restricted.

4. Min. dimension (900) is also recommended as unit width for calculating overall trolley parking space requirements.

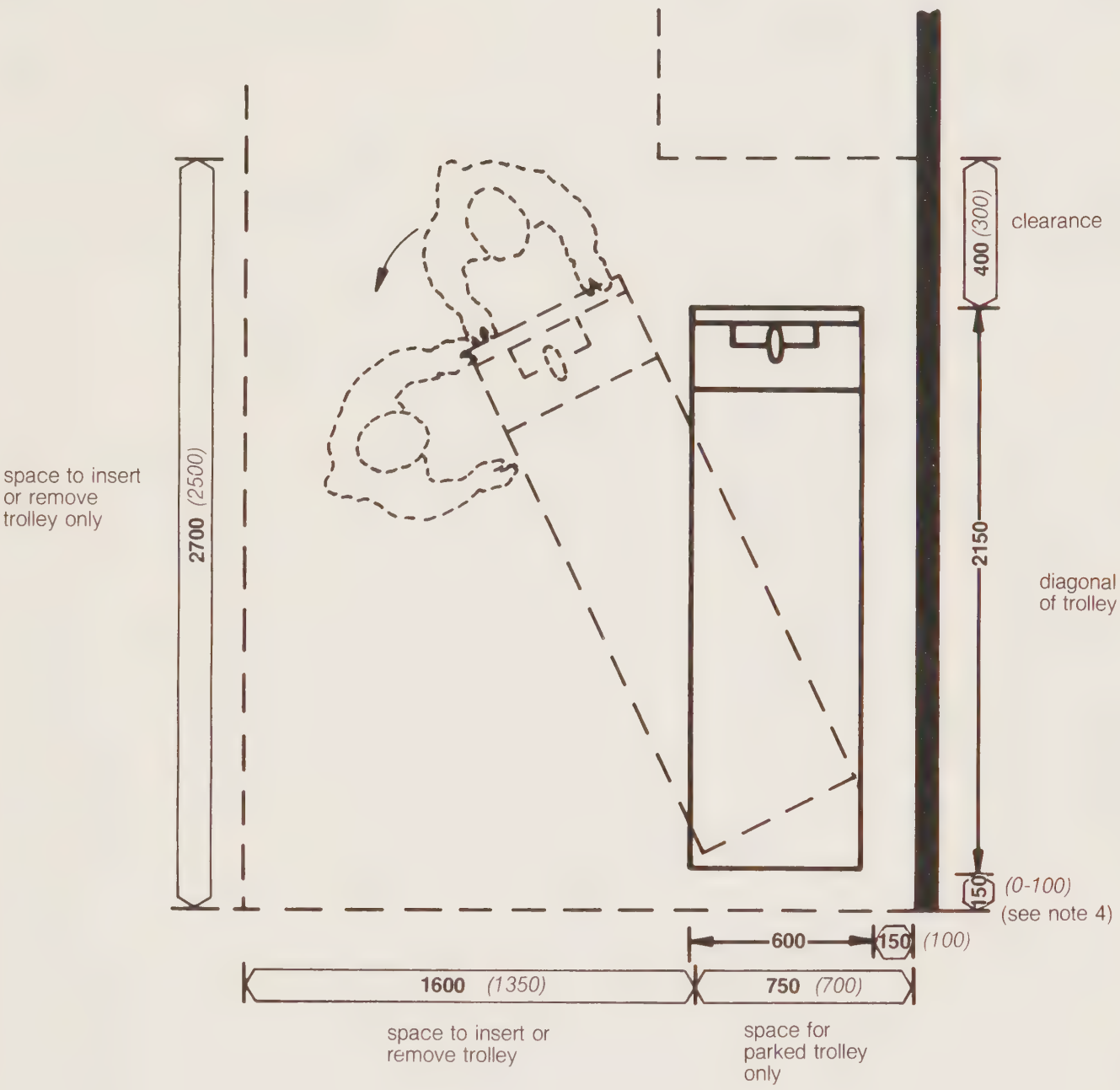
Activities:
Parking mortuary trolley (between obstacles) parallel to wall (1 or 2 staff - see note 2)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Mortuary Trolley

Hydraulic or Mechanical Lifting

Users:
Mortuary staff and Funeral Directors.



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. This is a very heavy trolley, therefore, failure to provide adequate operational clearances will result in severe and excessive damage to both equipment and building fabric

2. Trolley castor characteristics can vary or are variable. For one man operation two fixed (front) and two swivelling (rear) castors are necessary for satisfactory directional control. Trolleys with four freely swivelling castors generally require two man operation to maintain a safe line of travel.

3. Due to size and weight of trolley, trolley should ne parked by carefully steering the front end of the trolley into parking space and swinging rear end round to final parking position. For trolley removal, manoeuvre is reversed.

4. Parking position is located when buffer makes contact with buffer of adjacent trolley in parking zone. This must be executed with care and is suitable for unloaded trolleys only. It should definitely NOT be used where contact is with light internal partition walls. It is recommended that **2700** be used as the minimum unit length per parked trolley space when calculating overall parking space requirements for mortuary trolley.

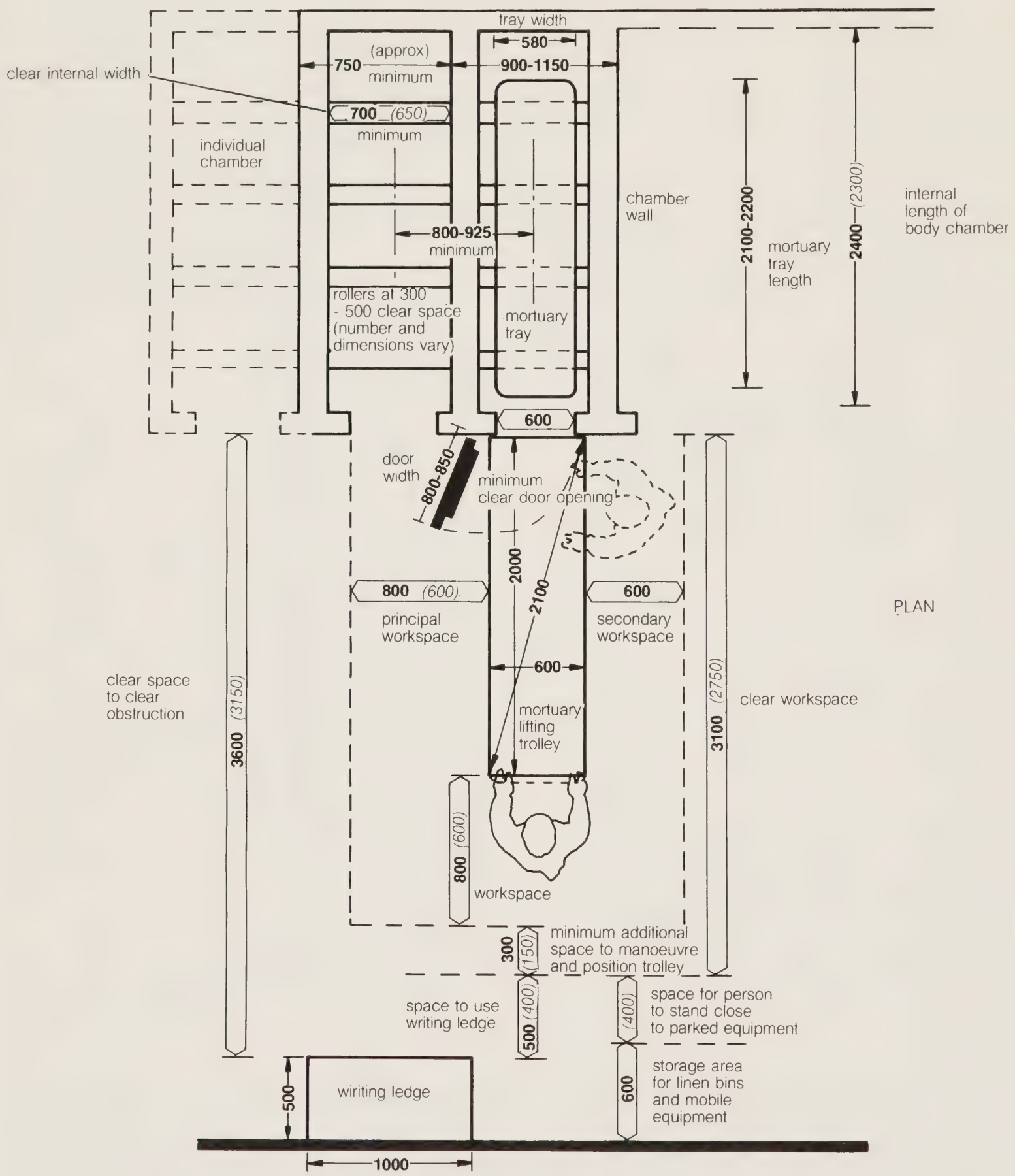
Activities:
Mortuary facilities for the multiple storage of bodies under cold (refrigerated) conditions, affording capability for mechanical handling of bodies using hydraulic trolley by one or two persons

DHSS **Ergonomic Data Bank:**
Component-user data sheet, not to scale

BODY STORE (1)

individual chambers

Users:
Mortuary staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

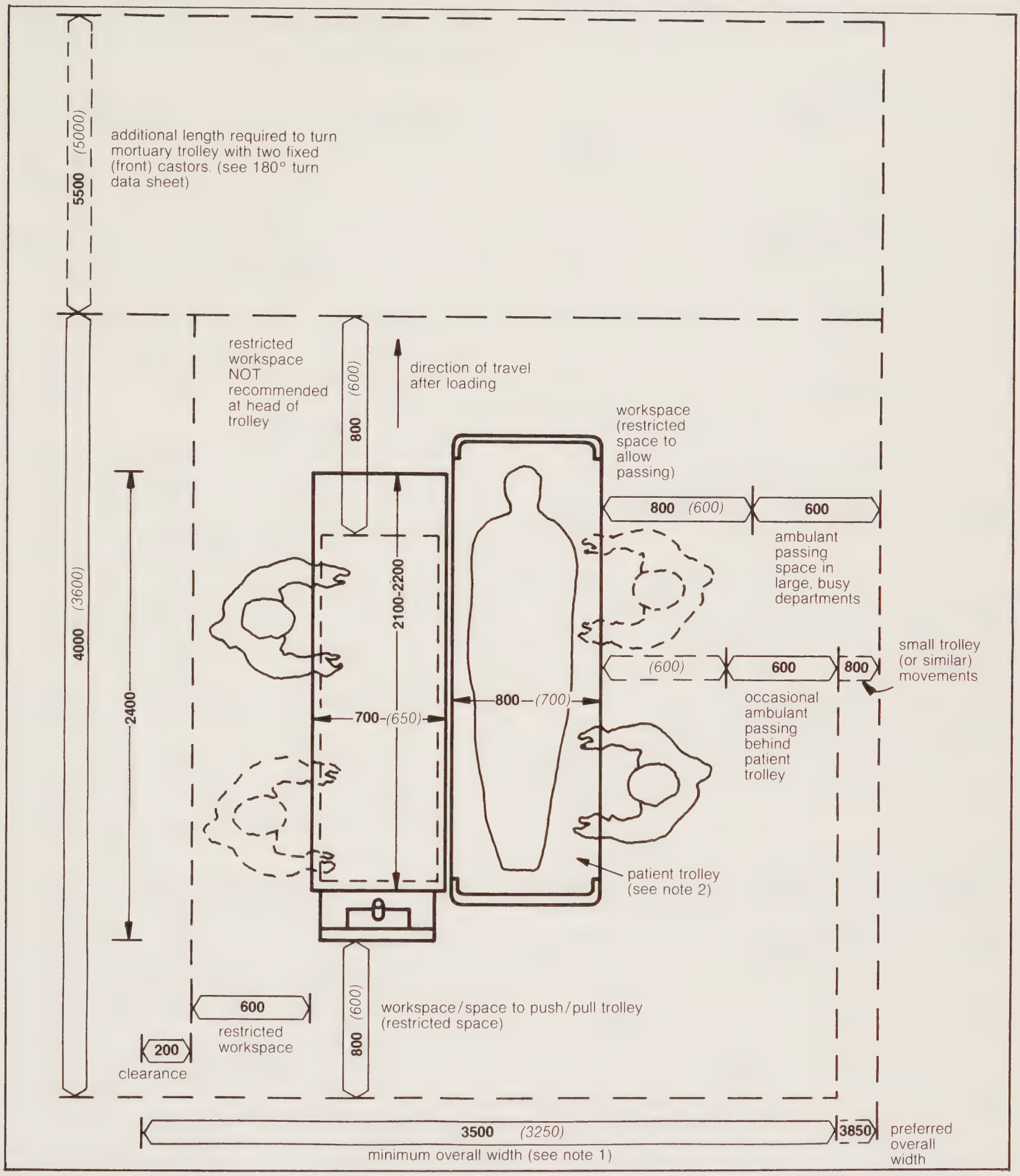
9

Activities:
Transfer of body from arrival trolley to mortuary department for conveyance to body store (2 or 4 staff - see note 3).

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Body Transfer
from Patient Trolley to Mortuary Trolley

Users:
Mortuary staff, ambulance staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. This width of space will accommodate turning of mortuary trolley prior to or after a body transfer, but a slightly wider space is preferable for 2 person operation especially with loaded trolley (see 180° turn data sheet).

2. Transfers will also occur from undertakers' trolleys (2000x600x800), or ambulance trolley. Incoming trolley will be pushed next to the mortuary (hydraulic) trolley and the transfer take place by equalising the height of the mortuary trolley to that of the other trolley. The transfer should not then involve lifting the body as it does from a patient trolley. Less transfer space could be accommodated.

3. The number of persons to assist in the transfer will vary according to staff levels. Two persons is an absolute MINIMUM; three adequate and four preferable for manual handling. Rollers or similar transfer aids should preferably be used where less than 3 staff are involved.

10

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